DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL

MAINTENANCE MANUAL

TRUCK, FORK, LIFT

GASOLINE, PNEUMATIC-TIRED

4,000 POUND CAPACITY

144 INCH LIFT HEIGHT

ARMY MODEL MHE 221

BAKER MODEL FJF-040

FSN 3930-151-4428

HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 1971

This reprint includes all changes in effect at the time of publication; changes 1 through 3.

SAFETY PRECAUTIONS

BEFORE OPERATION

1.Check logbook to insure lift truck has been properly serviced.

2. When servicing battery, do not smoke or use flame producing devices as batteries generate a highly explosive hydrogen gas.

3. Do not splash battery acid on hands, face, or eyes as acid will cause severe burns upon contact. Wash affected area immediately, using clean water or a solution of water and baking soda.

4. Check working area to insure that area is free of obstructions and cleared of all nonessential personnel.

5. Check that fire extinguisher is installed.

DURING OPERATION

1. Drive carefully to prevent injury to personnel or damage to material or equipment.

2. Insure that sufficient overhead and side clearance is available.

3. Travel with lift truck mast tilted fully-backward and forks raised just high enough above the ground to clear uneven surface conditions.

4. Reduce lift truck speed when making a turn or in congested areas.

5. Operator will avoid sudden starting or stopping of lift truck.

6. Check cargo before loading to insure rated load capacity of lift truck is not exceeded and that cargo can be moved safely.

7. Insure that cargo is properly stacked before lifting operation.

8. Insure that cargo is positioned against carriage backrest for safer traveling.

9. Operator will face in the direction lift truck is traveling and remain alert to prevent accidents.

10. Lift truck will be operated in reverse gear when moving bulky cargo, especially when operator's forward vision is obstructed.

11. Lift truck will be operated in reverse gear when descending a ramp or incline if cargo is loaded on forks.

12. When unloading multi-stacked cargo, slowly lower cargo directly over specific storage location as far as possible before tilting mast forward.

13. Use extreme care when multi-stacking cargo.

14. Do not use lift truck forks or rear end to bump or butt cargo.

15. Cease operations and report any malfunction or abnormalities found while operating lift truck to proper authority.

AFTER OPERATION

1. Insure that forks are firmly positioned on the ground.

2. Insure that key switch is in the OFF position, remove key.

3. Insure that parking brake is functioning and preventing movement.

4. If lift truck is to be parked on an include, place wheel chocks forward and aft of front wheels.

Changes in force: C 1, C 2, C 3, and C 4

CHANGE

No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *24 November 1989*

Operator's and Organizational Maintenance Manual

**TRUCK, FORKLIFT, GASOLINE, PNEUMATIC-TIRED,
4000 POUND CAPACITY, 144-INCH LIFT HEIGHT
(ARMY MODEL MHE-221, BAKER MODEL FJF-040)
NSN 3930-00-151-4428**

TM 10-3930-627-12, 7 July 1971, is changed as follows:

Cover and *page i.* The manual title is changed to read as shown above.

Page iii, List of Illustrations.

Delete the entry for Number 4-2.

Add Number "4-17.1, Transmission Shift Linkage, page 4-23".

Page 1-1.

Paragraph 1-2 is superseded as follows:

1-2. Maintenance Forms, Records, and Reports

Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by DA Pam 738-750.

Paragraph 1-4 is superseded as follows:

1-4. Reporting Errors and Recommending Improvements

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

Paragraph 1-4.1 is added after paragraph 1-4.

1-4.1. Reporting Equipment Improvement Recommendations (EIRs)

If your fork lift truck needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MP, Warren, MI 48397-5000. We'll send you a reply.

Page 1-11. Paragraph 1-7c(11) is rescinded.

Page 3-2.

Table 3-1, Sequence No. 9. *Procedure* column is changed to read: "Check electrolyte level. Level should be 3/8 inch above plates. If level is low, notify organizational maintenance.".

Paragraph 3-7e is superseded as follows:

e. Battery. Check electrolyte level. Level should be 3/8 inch above plates. If level is low, notify organizational maintenance.

Page 4-2, Table 4-1. Sequence No. 19 is added after Sequence No. 18.

19	Muffler	Inspect for rust holes, particularly near the lower end where condensation might collect. If muffler has rust holes, notify direct support maintenance.

Page 4-6. Paragraph 4-16 and figure 4-2 are rescinded.

Page 4-11, paragraph 4-25. Add the following Note immediately after the paragraph title.

Note. Prior to removal, refer to TB 750-1047, Elimination of Combustibles from Interiors of Metal or Plastic Gasoline and Diesel Fuel Tanks.

Page 4-18. Paragraph *4-30b.1* is added after paragraph 4-30b.

b.1. Radiator Testing.

(1) Tightly cap hose opening.

(2) Submerge radiator in water.

(3) With an adapter fitted to filler neck, force 3 to 5 pounds of air pressure into submerged radiator.

(4) Look for escaping air by observing air bubbles in water.

(5) Repeat steps (1) through (4) at connections to heat exchanger in radiator bottom tank.

Page 4-20. Paragraph 4-35.1 is added after paragraph 4-35.

4-35.1 Neutral Safety Switch

This assembly is mounted on the top of the transmission, where it is operated by the shifting linkage.

a. Removal.

(1) Remove the truck floor plate.

(2) Disconnect the electrical leads at the switch.

(3) Disconnect the shift linkage and control valve plunger from the pivoted lever plate which operates the roller of the sensitive switch.

(4) Remove the attaching screws which' hold the bracket to the top of the transmission and take the unit from the truck. If the sensitive switch has been removed from the assembly, it must be adjusted before putting it into service.

b. Adjustment.

(1) With the switch roller contacting the flat area of the striker plate, adjust the switch position just to the point where a click is heard in the switch.

(2) At this point, measure the distance between the switch body and the roller with a feeler gage.

(3) Move the switch 3/32 inch toward the striker plate, as measured with a feeler gage at the same point as in step (2) above, and lock the sensitive switch in position.

c. Installation.

(1) Adjust the mounting bracket to the transmission with attaching parts previously removed.

(2) Connect the shift linkage and control valve plunger to the lever plate.

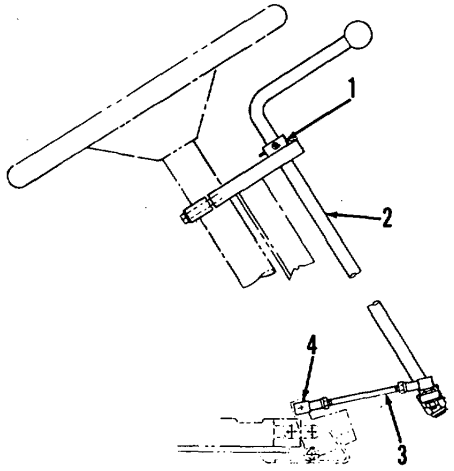
(3) Connect the electrical leads to the terminals of the switch and check that the starter can only be energized when the shift lever is in the neutral position. When adjustment is satisfactory, replace truck floor plate.

Page 4-23. Paragraph 4-38 is superseded as follows:

4-38. Transmission Linkage Adjustments

a. When transmission is shifted to neutral, groove pin on collar assembly (1, fig. 4-17.1) on shift lever (2) should align with neutral indicator. Shift transmission to neutral and check position.

b. If position needs adjustment, remove floorboards. Adjust position of lever by lengthening or shortening directional rod (3) by adjusting position of ball joints (4) on rod. Tighten lock nuts to secure adjustment. Check positions of shift lever in relation to shift positions of the transmission.



1. Collar assembly
2. Shift lever
3. Rod
4. Ball joint

TA502075

Figure 4-17.1. Transmission shift linkage.

Page 4-25. Paragraph 4-41a(14) is rescinded.

Page 4-32, paragraph *4-50a.* Change "(fig. 4-29)" to "(fig. 4-26)".

Page 4-36. Paragraph 4-54 is superseded as follows:

4-54. Oil Tank and Filters

a. Oil Tank Removal. It will be necessary to raise the truck or park it over a service pit for certain steps of the following procedures. The truck must be spotted where removal and installation of the tank can be done without moving the truck.

(1) Lower carriage fully, and tilt and tie uprights back.

(2) Remove hydraulic fluid from tank. Either remove plug from bottom of tank and drain fluid into large container, or use a suction transfer pump, with pickup hose inserted to bottom of tank through fill opening.

(3) Disconnect suction and return line hoses nearest tank. Remove four attaching nuts, lock washers, and flat washers, take tank from mounting studs
on frame, and remove tank from underside of truck.

b. Oil Tank Installation.

(1) Mount the tank on the four studs provided on the frame, and install the four nuts, flat washers, and lock washers which hold it in place.

(2) Connect suction and return line hoses to tank connection points.

(3) Replace plug in bottom of tank and refill tank with specified quantity of hydraulic fluid.

c. Filters.

(1) Tank is vented through the fill cap, which contains a filter element. In normal service, remove the fill cap and soak in SD every 500 hours of operation to remove accumulated dirt. When the truck is used in dusty areas, clean as often as needed.

(2) Referring to figure 4-26, note the suction line filter, shown removed from inside the tank. Clean this filter at least every 1000 hours of operation.

Page 4-36. Paragraphs 4-57 and 4-58 are added after paragraph 4-56.

4-57. Counterweight

a. Removal. Arrange a hoist to relieve the weight of the counterweight on the attaching bolts and remove bolts, nuts, and washers which attach the counter-weight to the frame. Hoist counterweight free of the frame.

b. Installation. Position counterweight to frame with suitable hoisting device and attach with bolts, nuts, and washers.

4-58. Floor Plate

a. Removal.

(1) Remove nuts, lockwashers, and plain washers at the corners of the floor plate.

(2) Pull accelerator pedal free of the throttle linkage.

(3) Raise the edge of the floor plate, and draw it clear of the brake pedals and steering gear.

b. Installation.

(1) Lay floor plate in position on truck frame with throttle linkage in position for connection to accelerator pedal.

(2) Install attaching parts previously removed.

Page A-1. Appendix A is superseded as follows:

APPENDIX A
REFERENCES

A-1. Fire Protection

TB 5-4200-200-100	Hand Portable Fire Extinguishers Approved for Army Users

A-2. Lubrication

C9100-IL	Fuels, Lubricants, Oils, and Waxes
LO 10-3930-627-12	Truck, Forklift, Gasoline, Pneumatic-Tired Wheels, 4000 Pound Capacity, 144-Inch Lift Height (Army Model MHE-221, Baker Model FJF-040) NSN 3930-00-151-4428
TB 703-1	Specification List of Standard Liquid Fuels, Lubricants, Preservatives, and Related Products Authorized for Use by the U.S. Army

A-3. Painting

AR 740-1	Storage and Supply Activity Operations
AR 746-1	Packaging of Army Materiel for Shipment and Storage
TM 43-0139	Painting Instructions for Field Use

A-4. Radio Interference Suppression

FM 11-65	High Frequency Radio Communications

A-5. Maintenance

DA Pam 738-750	The Army Maintenance Management System (TAMMS)
TB 750-651	Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems
TB 750-1047	Elimination of Combustibles from Interiors of Metal or Plastic Gasoline and Diesel Fuel Tanks
TM 5-331B	Utilization of Engineer Construction Equipment: Volume B; Lifting, Loading, and Handling Equipment
TM 9-2610-200-24	Organizational, Direct Support and General Support Care, Maintenance and Repair of Pneumatic Tires and Inner Tubes
TM 9-6140-200-14	Operator's, Organizational, Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries

A-5. Maintenance

TM 10-3930-627-20P	Organizational Maintenance Repair Parts and Special Tools List for Truck, Forklift; Gasoline Engine Driven, Pneumatic Tired; 4, 000 lb Capacity, 144-Inch Lift Height, (Baker Model FJF-040, Army Model MHE-221) (NSN 3930-00-151-4428)

A-6. Shipment and Storage

TB 740-97-2	Preservation of USAMECOM Mechanical Equipment and Storage
TM 740-90-1	Administrative Storage of Equipment

A-7. Safety

TB MED 501	Occupational and Environmental Health Hearing Noise and Conservation

Page B-1. Appendix B is superseded as follows:

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at the various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the third position of the SMR code.

i. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/ miles, etc.) considered in classifying Army equipment/components.

B-3. Explanation of Columns in the MAC, Section II

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, sub-assemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For a detailed explanation of these functions, see paragraph B-2.)

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a *work time* figure in the appropriate subcolumn(s), the level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/ assembly time), troubleshooting/ fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the Maintenance Allocation Chart. The symbol designations for the various maintenance levels are as follows:

C..... Operator or Crew
O ..... Organizational Maintenance
F ..... Direct Support Maintenance
H..... General Support Maintenance
D..... Depot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III

a. Column 1, Tool or Test Equipment Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National/NATO Stock Number. The National or NATO Stock Number of the tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

B-5. Explanation of Columns in Remarks, Section IV

a. Column 1, Reference Code. The code recorded in Column 6, Section II.

b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
01	**ENGINE**								
0100	Engine Assembly	Inspect		0.3					
		Test		1.0					
		Service	0.4						
		Replace			8.0				
		Repair			15.0				
		Overhaul				28.o			
0101	Crankcase, Block and Cylinder Head								
	Cylinder Head	Replace			2.0				
0102	Crankshaft	Replace				12.0			
0103	Flywheel Assembly	Replace			1.0				
0104	Pistons and Connecting Rods	Replace				4.0			
		Repair				2.0			
0105	Valves, Camshafts, and Timing System								
	Valves	Adjust		2.0					
		Replace			5.5				
	Gears, Timing	Inspect			0.5				
		Replace			2.6				
0106	Engine Lubrication System								
	Filter, Oil	Replace		0.2					
		Repair		0.2					
	Pump, Oil	Inspect			0.1				
		Replace			2.0				
		Repair			2.0				
0108	Manifold	Inspect	0.1						
		Replace	1.0						
03	**FUEL SYSTEM**								
0301	Carburetor, Fuel Injector	Adjust		0.3					
		Replace		1.0					
		Repair			2.0				
0302	Fuel Pumps	Test		0.3					
		Replace		0.5					
0304	Air Cleaner	Service	0.1						
		Replace		0.2					

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0306	Tanks, Lines, Fittings								
	Tank, Fuel	Service	0.1						
		Replace		0.4					
		Repair				1.5			
0308	Engine Speed Governor and Controls								
	Governor	Adjust		0.2					
		Replace			0.5				
		Repair			0.5				
0309	Fuel Filters	Replace		0.3					
		Repair		0.5					
0312	Accelerator, Throttle or Choke Controls								
	Pedal and Linkage, Accelerator	Service		0.1					
		Adjust		0.2					
		Replace		0.4					
04	**EXHAUST SYSTEM**								
0401	Muffler and Pipes								
	Muffler	Inspect		0.2					
		Replace			1.0				
05	**COOLING SYSTEM**								
0501	Radiator	Test		0.3					
		Service	0.2						
		Replace		1.0					
		Repair				2.0			
0503	Water Manifold, Headers, Thermostats and Housing Gasket								
	Thermostat	Test		0.5					
		Replace		0.5					
0504	Water Pump	Inspect		0.1					
		Replace		0.4					
0505	Fan Assembly								
	Belt, Fan	Inspect	0.1						
		Adjust		0.2					
		Replace		0.5					

MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
06	**ELECTRICAL SYSTEM**								
0601	Generator, Alternator								
	Alternator	Test		0.5					
		Replace		0.5					
		Repair			2.0				
0602	Generator Regulator (Voltage)	Test		0.3					
		Adjust		0.3					
		Replace		0.3					
0603	Starting Motor	Test			0.4				
		Replace		0.6					
		Repair			1.5				
0605	Ignition Components								
	Distributor	Inspect		0.2					
		Adjust		0.3					
		Replace		0.5					
		Repair		1.3					
	Spark Plugs	Test		0.2					
		Service		0.3					
		Adjust		0.3					
		Replace		0.5					
	Ignition Coil	Test		0.2					
		Replace		0.3					
0606	Engine Safety Controls								
	Neutral Safety Switch	Adjust		0.3					
		Replace		0.5					
0607	Instrument or Engine Control Panel								
	Instrument Panel and Gages	Inspect	0.1						
		Replace		1.0					
0608	Miscellaneous Items								
	Fuses	Replace		0.2					
0609	Lights								
	Stoplight, Taillight	Inspect	0.1						
		Replace		0.4					
	Spotlight	Inspect	0.1						
		Replace		0.2					

MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0610	Sensing Units and Warning Switches								
	Sending Units	Replace		0.4					
0611	Horn								
	Horn Button Assembly	Test	0.1						
		Replace		0.5					
	Horn	Replace		0.5					
0612	Batteries, Storage (Wet or Dry)								
	Battery	Inspect	0.1						
		Test		0.1					
		Service		0.3					
		Replace		0.3					
	Cables, Battery	Service		0.3					
		Replace		0.3					
0615	Radio Interference Suppression	Replace		0.5					
07	**TRANSMISSION**								
0705	Transmission Shifting Components	Adjust		0.5					
0708	Torque Converter or Fluid Coupling								
	Torque Converter	Service	0.2						
		Replace			0.8				
0710	Transmission Assembly	Test			2.0				
		Service	0.3						
		Replace			0.8				
		Repair				17.0			
		Overhaul				16.0			
0713	Intermediate Clutch	Replace				4.0			
		Repair				6.0			
0714	Servo Unit								
	Transmission Valve Assembly	Test			2.0				
		Replace			4.0				
		Repair			6.0				

MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0721	Coolers, Pumps, Motors								
	Oil Pump	Replace				2.0			
		Repair				2.0			
10	**FRONT AXLE**								
1000	Front Axle Assembly	Service		0.2					
		Replace			2.0				
		Repair			3.0				
1002	Differential	Adjust			1.0				
		Replace			4.0				
		Repair			4.0				
1003	Final Drive	Replace			1.0				
11	**REAR AXLE**								
1100	Rear Axle Assembly	Service		0.4					
		Adjust			1.0				
		Replace			8.0				
1104	Steering Sideshift and Wheel Leaning Mechanism								
	Steering Arms	Replace			2.0				
12	**BRAKES**								
1201	Hand Brakes								
	Lever, Cable, Hand Brake	Inspect	0.1						
		Service		0.1					
		Adjust		0.1					
		Replace		0.4					
1202	Service Brakes								
	Brake Shoes	Replace		1.0					
1204	Hydraulic Brake System	Service		0.1					
	Master Cylinder	Replace		1.0					
	Wheel Cylinder	Replace		1.0					
1206	Mechanical Brake System Pedal	Inspect	0.1						
		Adjust		0.2					
		Replace				0.5			

MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
13	**TIRES AND TUBES**								
1311	Wheel Assembly								
	Rims	Inspect		0.1					
		Replace		1.7					
		Repair		1.0					
	Hubs	Replace		0.3					
		Repair		0.3					
	Drums	Replace		0.5					
	Bearings and Seals	Test		0.1					
		Service		0.2					
		Replace		0.2					
1313	Tires, Tubes	Inspect	0.2						
		Replace		1.7					
		Repair		1.0					
14	**STEERING**								
1401	Mechanical Steering Gear Assembly								
	Drag Link	Adjust		0.4					
		Replace		2.0					
		Repair		3.0					
	Tie Rod	Service		0.4					
		Adjust		1.0					
		Replace		2.0					
1407	Power Steering Gear Assembly	Service		0.4					
		Adjust			1.0				
		Replace			4.0				
		Repair			2.0				
1411	Hoses, Lines, Fittings	Replace		0.3					
15	**FRAME, TOWING ATTACHMENTS, DRAW-BARS**								
1502	Counterweights	Inspect		0.1					
		Replace		1.0					

MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
18	**BODY, CAB AND HOOD**								
1801	Body, Cab and Hood	Replace		0.4					
	Engine Cover	Replace		0.5					
	Engine Cover Supports	Inspect Replace		0.1 0.5					
1805	Floors, Subfloors and Related Components	Inspect Replace		0.1 0.4					
1806	Upholstery Seats and Carpets	Inspect Replace		0.1 0.5					
22	**BODY, CHASSIS AND ACCESSORY ITEMS**								
2210	Data Plates	Replace		0.1					
24	**HYDRAULIC AND FLUID SYSTEMS**								
2401	Pump and Motor								
	Pump Rotary	Test Replace Repair			0.2 1.5 2.0				
2402	Manifold and/or Control Valves								
	Control Valve	Adjust Replace Repair		1.0 1.0	 2.0				
2403	Hydraulic Controls and/or Manual Controls								
	Control Levers and Linkage	Replace			1.0				
2404	Tilt Cylinders and Tilt Crank								
	Tilt Cylinder	Service Adjust Replace Repair		0.2 0.8 0.5	 1.5				

MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
2405	Mast Column								
	Lift Cylinder	Service		0.1					
		Replace			2.0				
		Repair			2.0				
	Mast Assembly	Service		0.3					
		Replace			1.5				
	Carriage Assembly	Service		0.4					
		Adjust			1.5				
		Replace			1.5				
	Chain, Lift	Service		0.2					
		Adjust		0.5					
		Replace		0.6					
2406	Strainers, Filters, Lines and Fittings								
	Lines and Fittings	Inspect		0.2					
		Replace		0.5					
2408	Liquid Tanks or Reservoirs	Service	0.2						
		Replace		0.7					
		Repair			1.0				
1801	Body, Cab and Hood	Replace		0.4					

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

Not Applicable.

Section IV. REMARKS

Not Applicable.

Page I-1, Index.

The following entries are added or superseded alphabetically:

The following entries are deleted alphabetically:

INDEX

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25F (Block Nos. 2149, 2150), Operator and Unit maintenance requirements for Truck Fork Lift, 4000 LB Capacity, Pneumatic Tire, Gas, Model MHE-221.

U.S. GOVERNMENT PRINTING OFFICE : 1994 0 - 300-421 (82187)

By Order of the Secretary of the Army:

W. C. WESTMORELAND
General, United States Army
Chief of Staff

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Major General, United States Army
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Distribution:

To be distributed in accordance with DA Form 12-25A (qty rqr block No. 893), Operator maintenance requirements for Warehouse Equipment.

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., *22 March 1974*

Operator and Organizational Maintenance Manual
TRUCK, FORKUFT, GASOLINE, PNEUMATIC TIRED,
4000 POUND CAPACITY, 144 INCH UFT HEIGHT,
ARMY MODEL MHE-221, BAKER MODEL FJF-040
FSN 3930-151-4428

TM 10-3930-627-12, 7 July 1971, is changed as follows:

Inside Front Cover. Add the following warning to the list of safety precautions:

WARNING

Operation of this equipment presents a noise hazard to personnel in the area The noise level exceeds the allowable limits for unprotected personnel Wear ear muffs or ear plugs which were fitted by a trained professional

Page 1-1. Paragraph 1-4 is superseded as follows:

1-4. Recommendation for Maintenance Publications Improvements

You can help to improve this manual by calling attention to errors and by recommending improvement. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to: Commander, US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Blvd, St Louis, MO 63120. A reply will be furnished direct to you.

Page 23. Immediately after Section III title, add the following warning:

WARNING

Operation of this equipment presents a noise hazard to personnel in the *area* The noise level exceeds the allowable limits for unprotected personnel. Wear ear muff or ear plugs which were fitted by a trained professional.

Page A-1, paragraph A-$. Add the following reference: ITB MED 251, Noise and Conservation of Hearing'.

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25A (qty rqr block No. 893), Operator maintenance requirements for Warehouse Equipment.

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., *20 April 1973*

Operator and Organizational Maintenance Manual
TRUCK, FORKUFT, GASOLINE, PNEUMATIC TIRED,
4000 POUND CAPACITY, 144 INCH UFT HEIGHT,
ARMY MODEL MHE-221, BAKER MODEL FJF-040
FSN 3930-151-4428

TM 10-3930-627-12, 7 July 1971, is changed as follows:

Page A-1. Appendix A is superseded as follows:

APPENDIX A
REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users.

A-2. Lubrication

C9100-IL	Fuels, Lubricants, Oils, and Waxes
TB 703-1	Specification List of Standard Liquid Fuels, Lubricants, Preservatives, and Related Products Authorized for Use by the U. S. Army.
LO 10-3930-627-12-1 and LO 10-3930-627-12-2	Truck, Lift Fork, G. E. D., Pneumatic Tires, 4000 Lb Capacity, 144 In Lift(Baker Model FJF-040) Army Model MHE-221, W/Engine Continental Model FS162.

A-3. Painting

AR 740-1	Storage and Supply Activity Operations
AR 74-1	Color, Marking, and Preparation of Equipment for Shipment
TB 746-93-1	Color and Marking of Military Vehicles, Construction Equipment, and Materials Handling Equipment.

A-4. Radio Suppression

TM 11-483	Radio Interference Suppression

A-5. Maintenance

TM 9-2610-200-20	Care, Organizational Maintenance, and Repair of Pneumatic Tires and Inner Tubes.
TB 750-651	Use of Anti-Freeze Solutions, and Cleaning Compounds in Engine Cooling Systems.
TM 5-331B	Utilization of Engineer Construction Equipment Volume B - Lifting, Loading, and Handling Equipment.
TM 10-3930-627-20P	Organizational Maintenance, Repair Parts, and Tools Lists: Truck, Lift, Fork, Gasoline, Pneumatic Tired, 4,000 Lb Capacity, Army Model MHE-221, Baker Model FJF-040, FSN 3930-151-4428.
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 9-6140-200-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Storage Batteries: Lead-Acid Type.

A-6. Shipment and Storage

TM 740-90-1	Administrative Storage of Equipment
TB 740-97-2	Preservation of USAMECOM Mechanical Equipment and Storage.

Page C-1. Appendix C is superseded as follows:

APPENDIX C
BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists items required by the operator for operation of the fork lift truck.

C-2. General

This list is divided into the following sections:

a. Basic Issue Items List-Section II. Not applicable.

b. Items Troop Installed or Authorized List--Section III. A list of items in alphabetical sequence, which at the discretion of the unit commander may accompany the fork lift truck when it is evacuated. These items are not subject to turn-in with the fork lift truck when it is evacuated.

C-3. Explanation of Columns

The following provides an explanation of columns it the tabular list of items troop installed or authorized, section III.

a. Source, Maintenance and Recoverability Code (SMR). Not applicable.

b. Federal Stock Number. This column indicates the Federal stock number assigned to the item which will be used for requisitioning purposes.

c. Description. This column indicates the Federal item name and any additional description of the item required.

d. Unit of Measure (U/M). A two-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based; e.g., ea, ft, pr; etc.

e. Quantity Authorized. This column indicates the quantity of the item authorized to be used with the equipment.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR codes	(2) Federal stock number	(3) Description	(4) Unit of meas	(5) Oty Auth
	7520-559-9618	CASE: Maintenance, and operation manuals.	ea	1
	4210-889-2221	EXTINGUISHER: Fire	ea	1

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25A (qty rqr block No. 893), Operator Requirements for Warehouse Equipment.

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., *28 February 1972*

Operator and Organizational Maintenance Manual

TRUCK, FORKLIFT, GASOLINE, PNEUMATIC TIRED,

4000 POUND CAPACITY, 144 INCH UFT HEIGHT,

ARMY MODEL MHE-221, BAKER MODEL FJF-040

FSN 3930-151-4428

TM 10-3930-27-12, 7 July 1971, is changed as follows:

Page 1-3, paragraph 1-5b. In lines 1, 2 and 3, change to read,

"*b. Engine.* The truck is powered by a four cylinder Continental FS-162 gasoline engine. See figure 1-2. Operation of the engine is * * * "

Page 1-5. Paragraph 1-5e is superseded as follows:

e. Steering Axle (fig. 13). The rear axle is steerable, thereby providing maneuverability of the truck in a limited working space.

Paragraph 1-5f. In last sentence, change "two-handled" to read "two lever".

Page 1-7. Paragraph 1-5h (1). In line 5, delete "itself".

Page 1-10. Paragraph 1-7a (6) is superseded as follows:

(6) Plate at rear face of mast top:

CAUTION

DO NOT TOW OR PUSH THIS TRUCK
IN EXCESS OF 2 MPH.

Paragraph 1-7c (1). Immediately after "Wheels", change to read, "2 dual drive wheels and 2 steerable wheels".

Paragraph 1-7c (3). Immediately after "Type", delete "(Military Standard)".

Paragraph 1-7c (5). After "Fluid", delete "OE 10" and add, "Hydraulic Fluid, Automatic Transmission."

Page 1-11. Paragraph l-7c (10). Under "Spark Plugs", add, "Type Champion XD 16 or equal."

Page 2-1. Paragraph 2-2c is superseded as follows:

c. Wash preservative coating from truck parts using dry cleaning solvent P-D4-680. Do not wash lubricant from mast assembly.

Page 2-2. Paragraph 2-6e is superseded as follows:

e. Double Brake Pedal Pressure on either pedal operates the inching valve and applies the brakes.

Paragraph 2-6e (1) and (2) are rescinded.

Page 2-3. Paragraph 2-6f is superseded as follows:

f. Shift Lever. This lever is used to shift the transmission into FORWARD, NEUTRAL, or REVERSE.

Paragraph 2-6g. in line 2, change "drawing" to read "moving", and in line 5, change "whatever" to read "the".

Paragraph 2-7b (2) is rescinded.

Paragraph *2-8c.* In line 1, change "Draw" to read "Pull".

Paragraph 2-8e. In line 2, delete "until it starts".

Page 2-5. Paragraph *2-14a.* In line 4, change "General Support" to read "Direct Support".

Page 3-1. Paragraph 3-2 is superseded as follows:

3-2. General

Lubricate the forklift truck in accordance with LO 10-3930-627-12.

Paragraph 3-3. Add the following sentence: "Check the adequacy of lubrication on the mast column before operation and add lubrication when necessary."

Page 3-2. Paragraph. 3-6. In line 3, change "subnormal" to read "abnormal".

Page 4-2. In sequence 7, change reference 4-55 to read 4-53.

Page 4-3. In Table 4-2, step 1, under Probable Cause and Corrective Action, change step *"b"* to "*c*" and step "*c*" to *"b".*

In Table 4-2, step 2, under Probable Cause and Corrective Action, step "c" is rescinded.

In Table 4-2, step 9, under Probable Cause and Corrective Action, change step "a" to "b" and step *"b"* to "a".

Page 44. Table 4-2, steps 15 and 16 are superseded as follows:

	Malfunction	*Probable cause*	*Corrective action*
15.	Truck will not lift rated load	a. Damaged line or fitting	a. Replace damaged lines or fittings (para 4-50)
		b. Lift chain broken or damaged.	*b.* Replace chain (para 4-53).
		c. Damaged hydraulic pump or lift cylinder.	*c.* Refer to Direct Support.
16.	Truck lifts, but will not lower load.	Stop engine, set brake, block load in raised position to prevent damage or personnel injury.	Notify supervisor immediately.

Page 4-25. Paragraph 4-41a *(3),* immediately after "wheels", delete period and add "(para 445)."

Page C-3. Section II. Columns 2 and 2, immediately after Hydraulic Reservoir are superseded as follows:

(1)	(2)	(3)
Hydraulic Reservoir	9150-698-2382	(2) Hydraulic fluid, Automatic Transmission: 1 qt. can
	9150-657-4959	(2) Hydraulic Fluid, Automatic Transmission: 5 gal. pail

TECHNICAL MANUAL
No. 10-3930-627-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., 7 *July 1971*

Operator and Organizational Maintenance Manual

TRUCK, FORKLIFT, GASOLINE, PNEUMATIC TIRED,

4000 POUND CAPACITY, 144 INCH UFT HEIGHT,

ARMY MODEL MHE-221, BAKER MODEL FJF-040

FSN 3930-151-4428

LIST OF ILLUSTRATIONS

CHAPTER 1

INTRODUCTION

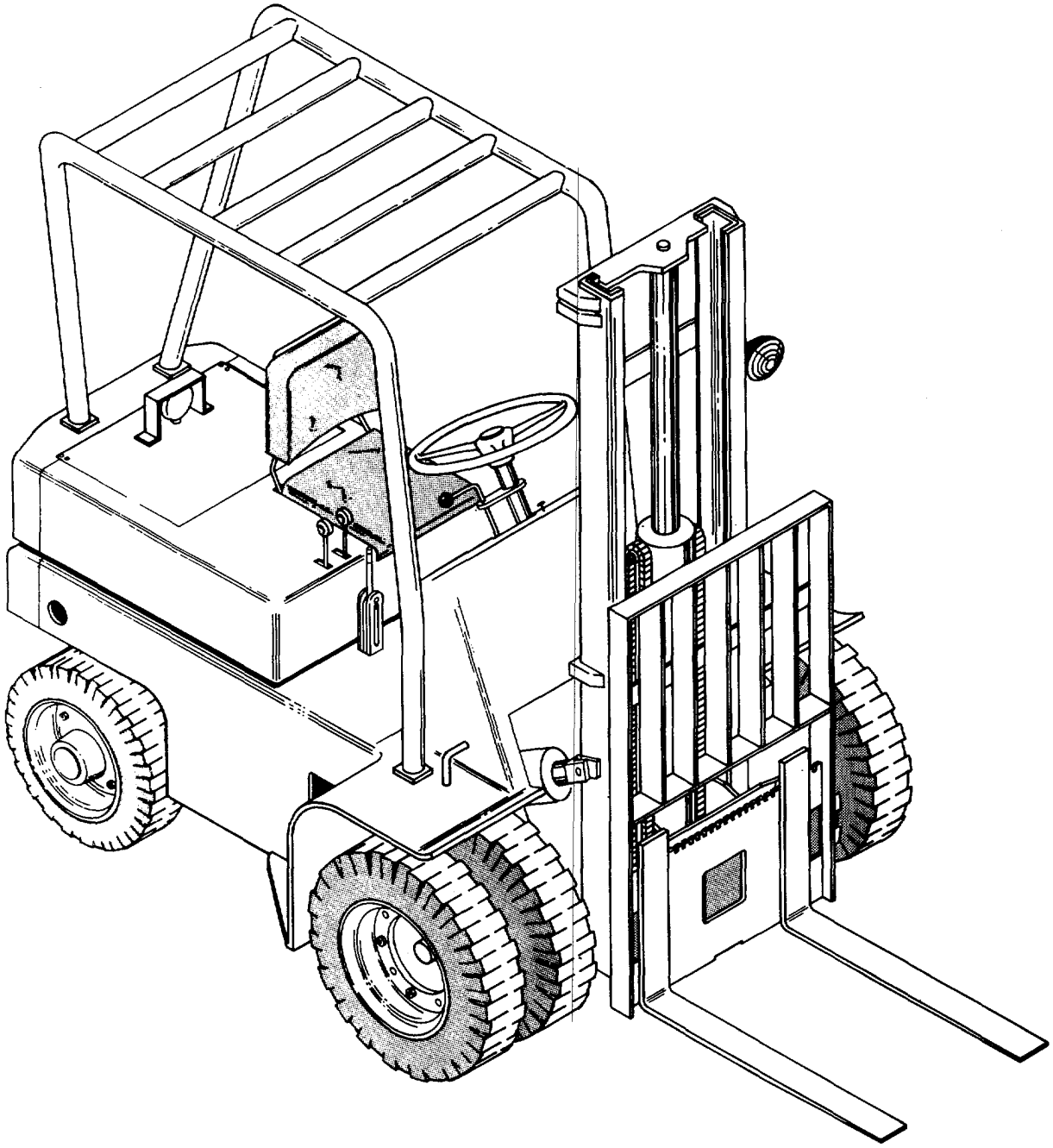
Section I. GENERAL

1-1. Scope
These instructions constitute the operation and organizational maintenance instructions for the gasoline engine powered fork lift truck, pneumatic tires, Baker model FJF-040. See figure 1-1.

1-2. Forms and Records
Maintenance forms, records and reports to be used by maintenance personnel at all levels of maintenance are listed in and prescribed by TM 38-750.

1-3. Equipment Serviceability Criteria
This paragraph is not applicable to the fork lift truck.

1-4. Reporting of Errors
Reporting of errors, omissions, and recommendations for improving this publication by the user is encouraged. Reports should be submitted on DA Form 2028, (Recommended Changes to Publications) and forwarded direct to Commanding General, U. S. Army Mobility Equipment Command, ATTN: AMSME-MP 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.



ME-3930627-12/1-1

Figure 1-1. FJF-040 Fork lift truck.

Section II. DESCRIPTION AND DATA

1-5. Description

a. General. The Baker Model FJF-040 fork lift truck is non-tactical materials handling equipment, suitable for use in warehouse and yard operations. The pneumatic tires permit use on unpaved surfaces. The truck is designed for the handling and stacking of palleted and packaged loads to a load limit of 4000 pounds at a 24 inch load center on the forks. The truck can lift and stack a load to a height of 144 inches.

b. Engine. The trucks are powered by four-cylinder Continental FS-162 Military Standard engines. See figure 1-2. Operation of the engines is conventional. The fuel system includes an updraft carburetor and mechanical fuel pump. The ignition system is battery powered, and includes radio interference suppression, but not shielding. An alternator with an external voltage regulator supplies current for operation of the electrical system, and for charging the battery.

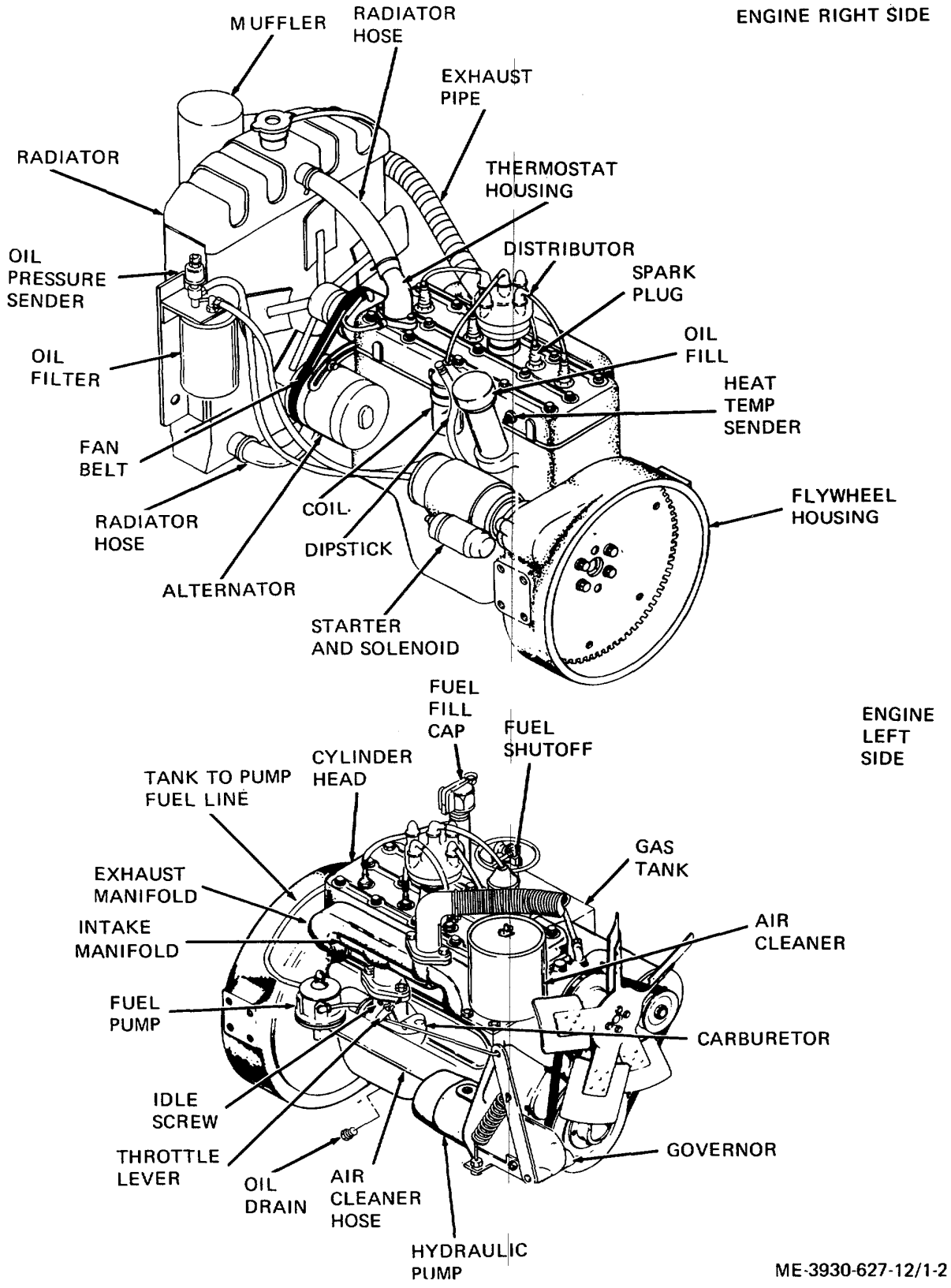


Figure 1-2. Engine.

c. Transmission. This is a constant mesh, power shifted unit with forward, reverse, and neutral shift positions available. Engine output is sent through a torque converter to the transmission, which delivers it to the front, or drive axle. Since all transmission gears are in constant mesh, they are coupled, when drive is needed, by hydraulic application of internal clutches. Operation of the shift lever on the steering column works a selector valve on the transmission which applies and releases the drive clutches needed for forward or reverse travel. In neutral the valve simply dumps all pressure. Since the transmission fluid may get quite hot when working hard, it is circulated through a cooler on the truck radiator.

d. Drive Axle. The drive (front) axle is a double reduction heavy duty industrial unit, fitted with dual wheels to support the weight of the truck plus load. The wheels of this axle are fitted with self- adjusting hydraulic brakes.

e. Steering Axle (fig. 1-3). The rear axle is steerable, for greatest maneuverability in limited working space. Steering geometry is neutral; there is no tendency for the wheels to return to straight ahead position when the steering wheel is released. A Saginaw power steering gear operates the steering axle.

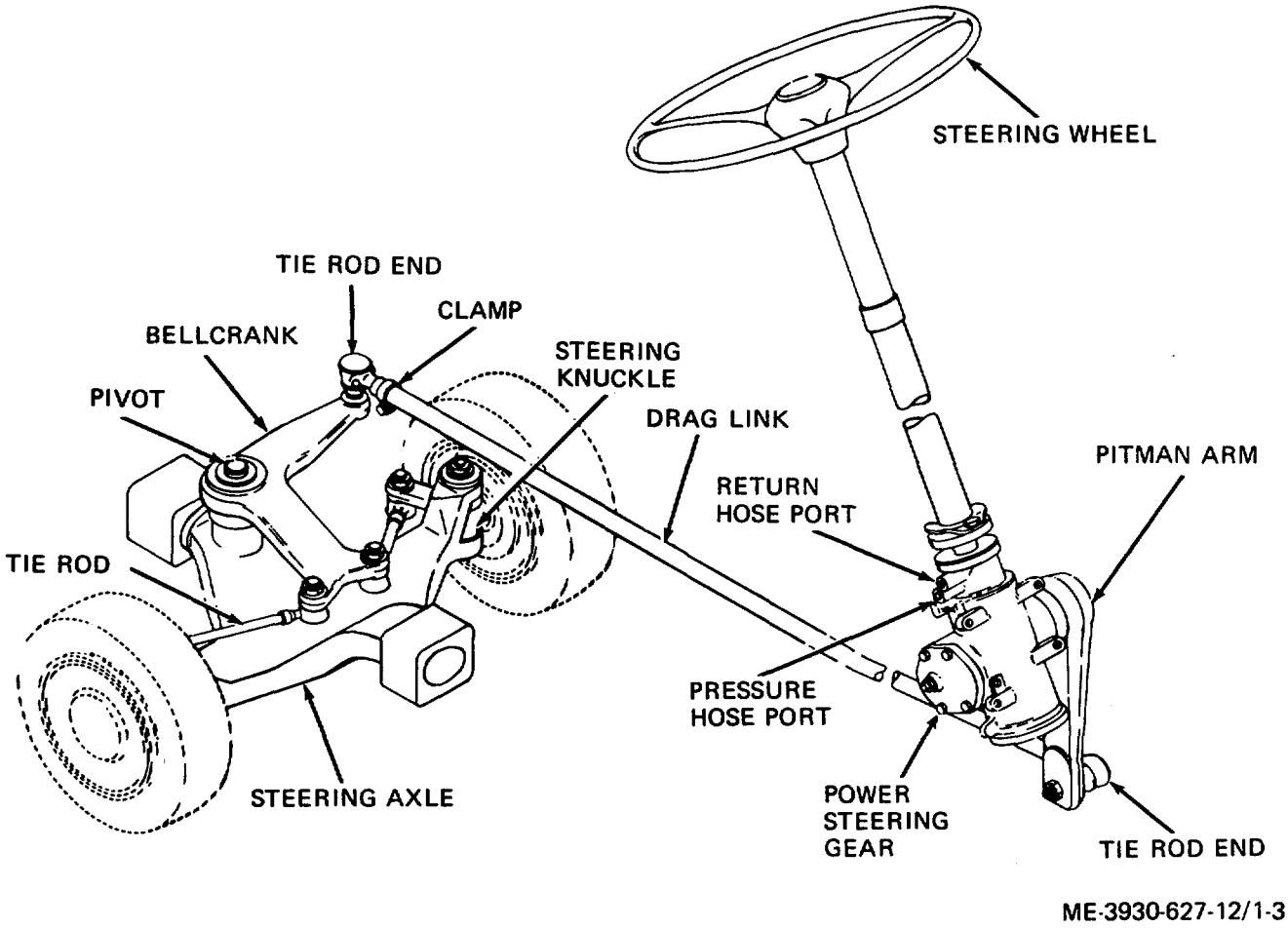


Figure 1-3. Steering System.

f. Mast (fig. 1-4). This is the load handling system of the truck. Two forks are attached to a carriage which is raised by a hydraulic cylinder. Two channel iron upright members guide the carriage in its travel, the channels acting as guide rails for rollers on the carriage. The entire mast as a unit can be tilted forward when slipping the forks under a load, then tilted back to cradle the load when hoisting or traveling. A two-handled control valve at the right of the driver's seat controls lift, and tilting of the mast.

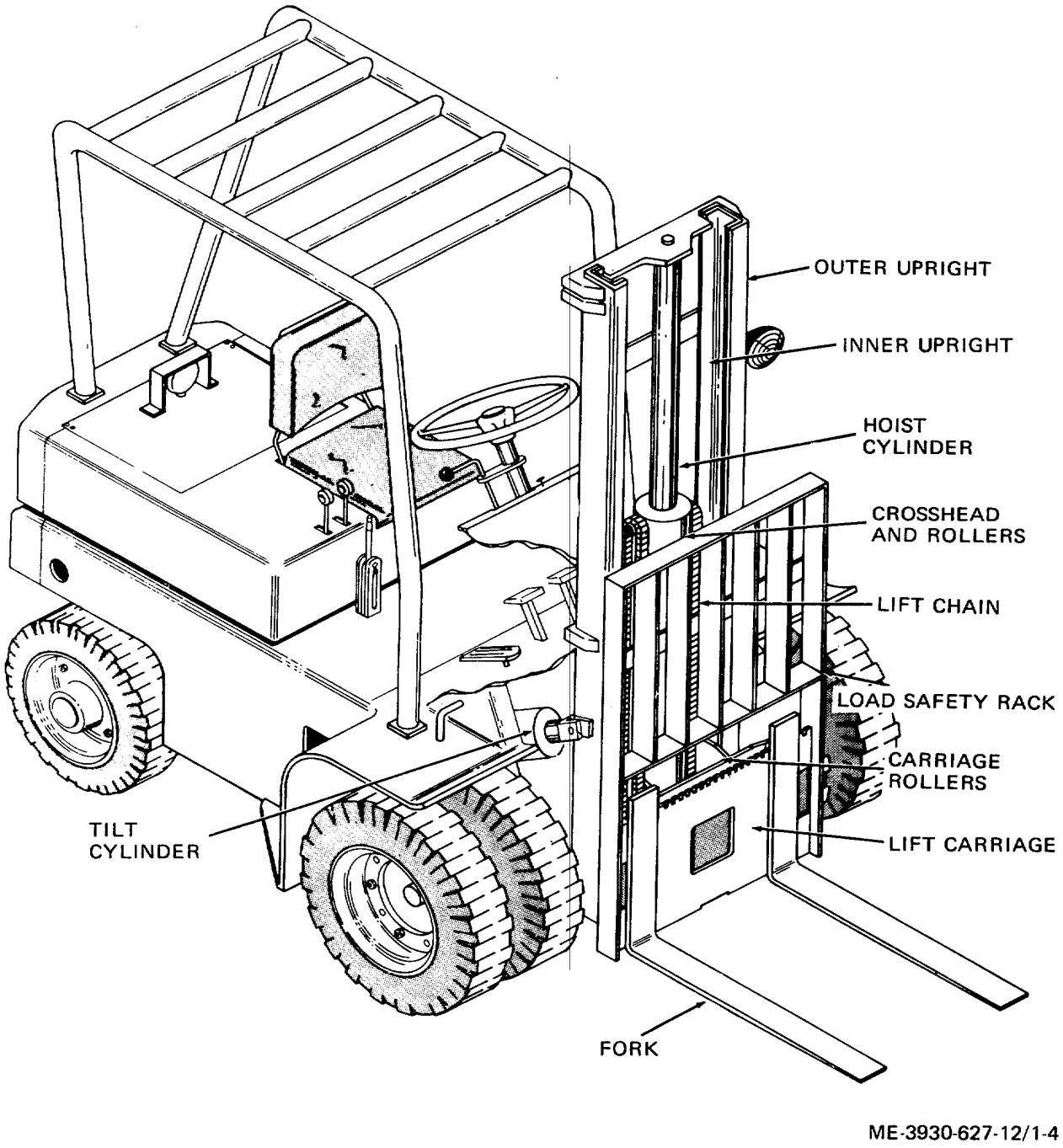


Figure 1-4. Mast features.

g. Mast Hydraulic System (fig. 1-5). Using pressure from the hydraulic pump, the control valve directs pressure to the hoist cylinder to raise the load, and to the tilt cylinders to tilt the uprights. The priority (flow divider) valve on the pump supplies pressure to the power steering unit. The two-spool control valve has a handle for each spool. he inboard handle controls the hoist cylinder, and e outboard handle works the tilt cylinders. The hoist cylinder is a two-stage single acting unit, raised by pressure and lowered by gravity; the tilt cylinders are double-acting.

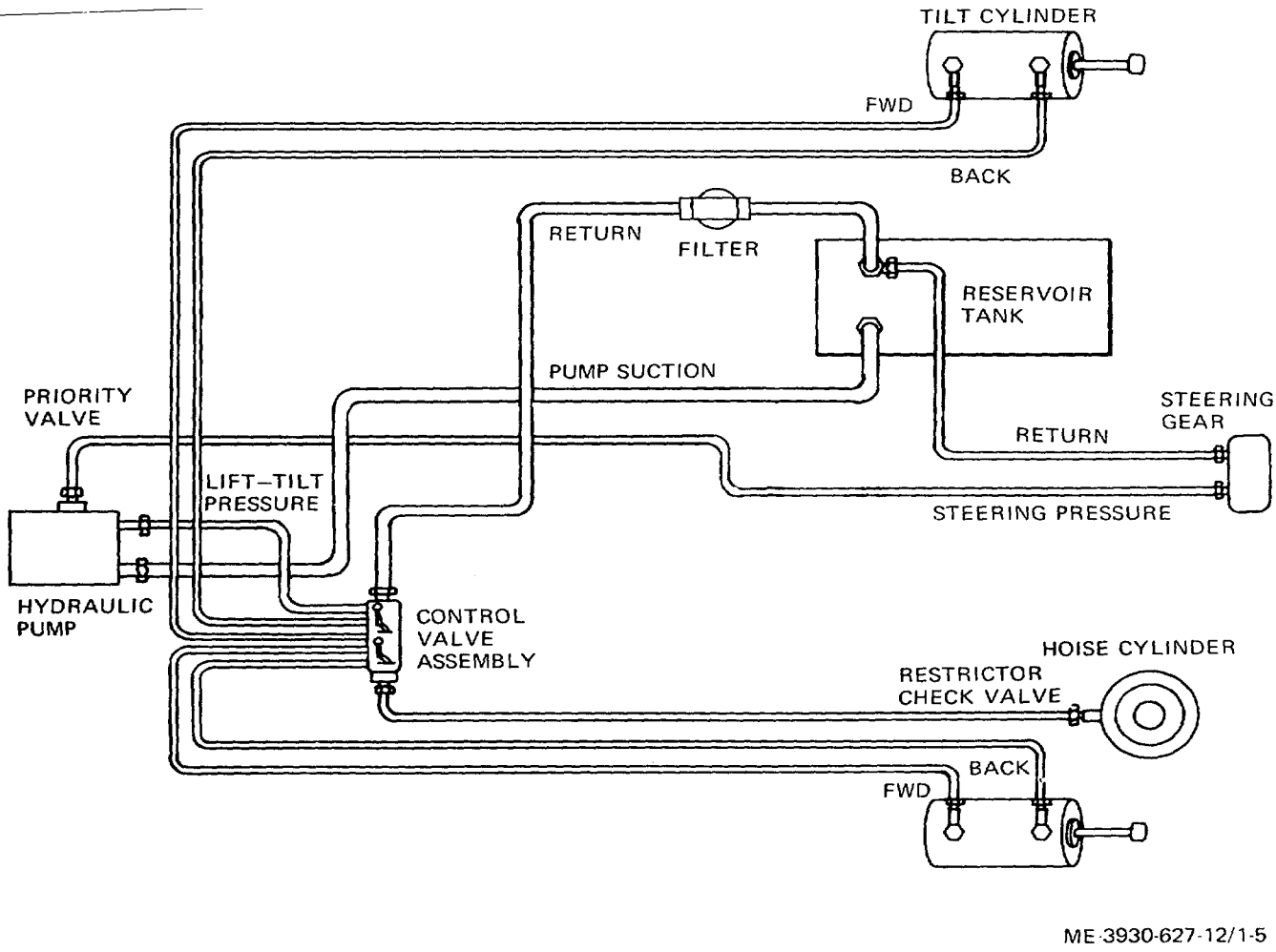


Figure 1-5. Hydraulic System.

h. Electrical Units.

(1) *Spotlight.* The sealed-beam spotlight is mounted on the left hand hoist upright. This light is operated by a toggle switch mounted on the instrument panel. The switch mounted on the spotlight itself is bypassed, and will not operate the light.

(2) *Combination tail and stop light.* The tail and stop light is mounted within a steel guard on the upper rear of the engine compartment. The taillight operates when the spotlight is turned on. The stop light is operated by the brake light switch when the foot brakes are used.

(3) *Ignition switch.* The ignition switch is mounted on the instrument panel. Setting the ignition switch to ON position energizes the ignition system and instrument panel gages.

(4) *Fuel gage sending unit.* The fuel gage sending unit is mounted atop the fuel tank. This unit consists of a float mounted on an arm attached to a sliding contact. The position of the arm is proportional to the quantity of fuel. The slider shorts out turns of a resistance winding to change the current in the gage circuit proportional to the fuel level, which is registered on the instrument.

(5) *Oil pressure sending unit.* The oil pressure sending unit is connected into the pressure side of the lubricating oil system. This unit contains a coil, the resistance of which varies with pressure. Actuating current to the instrument passes through this resistance coil which varies the current, and thus the indication, in proportion to the pressure on the sending unit.

(6) *Coolant temperature sending unit.* The coolant temperature sending unit is threaded into the engine cylinder head (fig. 1-2) to sense and respond to engine coolant temperature. This unit contains a temperature sensitive resistance coil

which regulates the flow of actuating current to the engine temperature gage in proportion to engine coolant temperature.

(7) *Instrument panel* (fig. 1-6). The instrument panel assembly incorporates the usual standard instruments in a compact group. The engine operation hourmeter is used to determine when periodic service operations are due. In addition to controlling the ignition system, the ignition switch energizes the instruments, and the starter circuit up to the starter button. The light switch operates the spotlight and taillight.

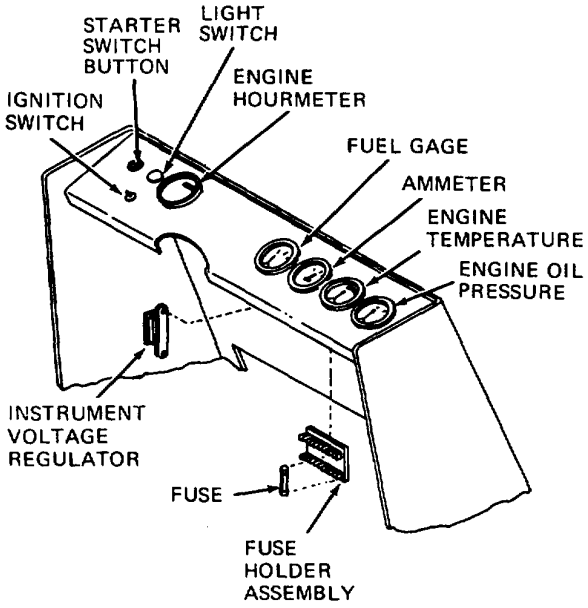


Figure 1-6. Instrument Panel

(8) *Fuses.* The fuses in the fuse holder protect the various electrical circuits of the truck. Refer to the wiring diagram (fig. 1-7) for identification of each fuse.

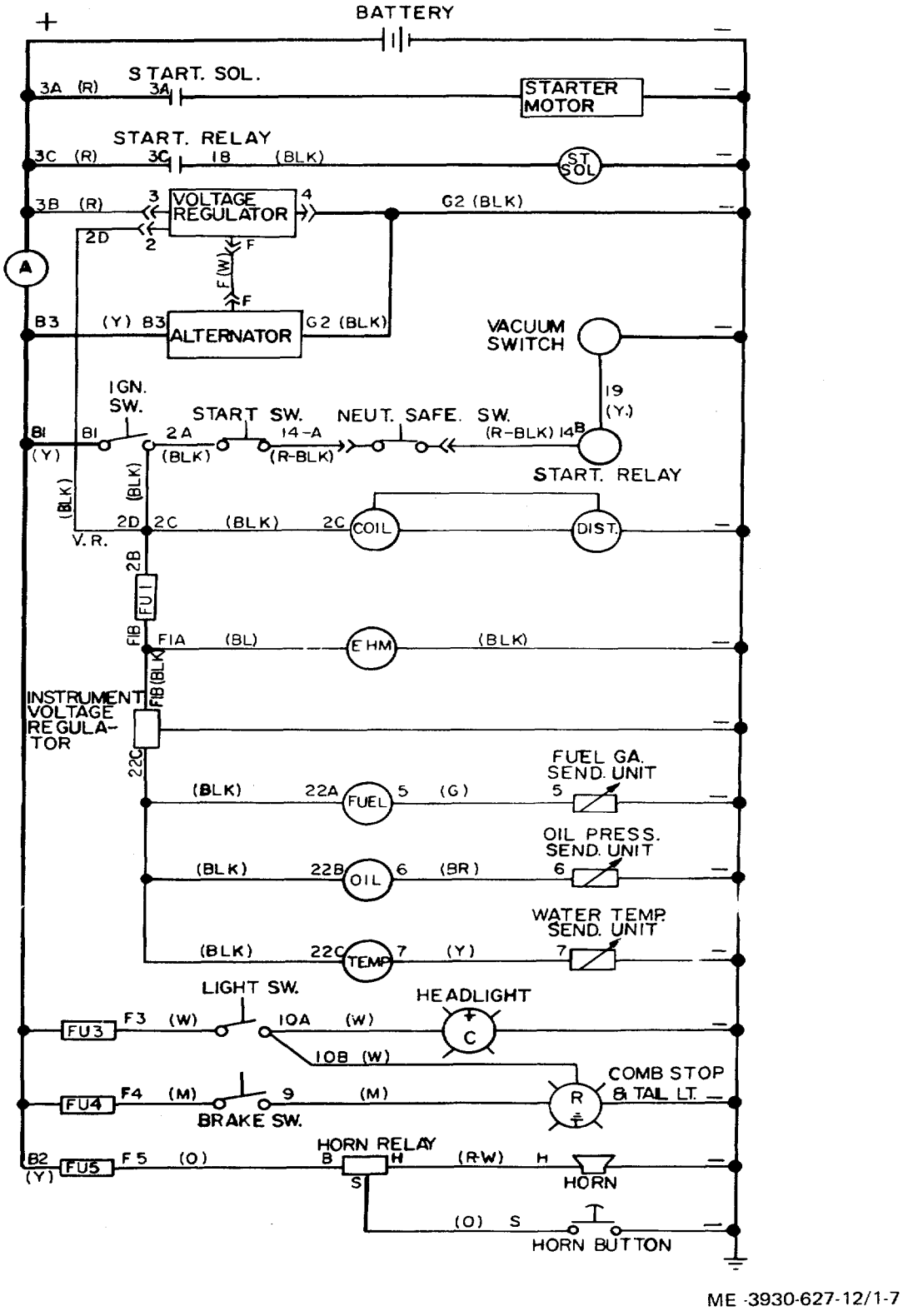


Figure 1-7. Wiring diagram.

(9) Instrument voltage regulator. The instrument voltage regulator is a small voltage divider which reduces system voltage to six volts for instrument power.

1-6. Differences Among Models

This manual covers the Baker Model FJF-040 Gasoline Powered fork lift truck, pneumatic tired. Trucks covered in this manual are those procured under contract DSA-400-70-C-3557 only. There are no known differences among trucks covered in this manual.

1-7. Identification and Tabulated Data

a. Instruction Plates.

(1) HOIST-UP-DOWN plate at lift control handle.

(2) TILT-OUT-IN plate at tilt control handle.

(3) START plate at starter switch.

(4) LIGHTS ON-OFF plate at light switch.

(5) IGN ON-OFF plate at ignition switch.

(6) Plate at rear face of mast top CAUTION: DO NOT TOW OR PUSH THIS TRUCK.

(7) Plate at right front, truck frame. Wheel loading data, loaded and empty.

(8) Plate at right front, truck frame. Shipping data, center of gravity location and lift point ratings.

b. Identification Plates.

(1) Plate at right front, truck frame. Truck identification, per MIL-P-514.

(2) Engine plate, side of crankcase, per MIL-P-5 14.

(3) Transmission plate, side of case. Specifies make, model and serial number.

c. Tabulated Data.

(1) *General.*

Rated Capacity	4000 Lb at 24 in. from heel of fork
Lift Type	Telescopic upright boom, tiltable 3 deg forward, 10 deg backward from upright
Lift Elevation (Max)	144 in.
Fork Data	4 in. wide prongs, 40 in. long. Adjustable from 9 to 38 in.
Wheels	4 drive wheels and 2 steerable wheels
Tires	Pneumatic, size 7.00 x 12 (drive axle), and 6.90/6.00 x 9 (steering axle)
Tire pressure (all)	100 psi
Vehicle turning radius	90 in. min. outside turning radius
Vehicle top speed	12 mph
Maximum towed speed	2 mph

Note. Observe instruction plate details at rear face of mast top crossmember.

(2) *Overall dimensions and weight.*

Height (forks fully lowered)	91 in.
Height (forks fully raised)	192 in.
Width	63 in.
Length (less forks)	91 in.
Vehicle weight	8034 Lb
Ground clearance	3 in.
Attachments	Overhead guard and load safety rack

(3) *Engine.*

Type (Military Standard)	Continental Model No. FS162
Number of cylinders	4
Max. oil pressure hot at 1800 rpm	30 to 40 psi
Min. oil pressure	7 psi at idle
Firing order	1-3-4-2
Oil Capacity:	
Crankcase	31 qt
Filter	1 qt
Total	4½ qt
Valve Clearance:	
Intake	0.014 in.
Exhaust	0.014 in.
Cooling system capacity	11% qt

(4) *Fuel system.*

Carburetor:	
Make	Zenith
Type	Updraft, single bore
Adjustments:	
Idle mixture screw	1 to 1.5 turns open
Idle speed	450 to 500 engine rpm
Fuel Pump:	
Pressure (static)	1.5 to 2.25 psi
Capacity (minimum)	1 pt per min.
'Fuel tank capacity	12.7 gal.
Governor setting	2600 engine rpm

(5) *Transmission.*

Make	Baker
Type	Single-speed with forward and reverse constant mesh, power-shifted by selective engagement of clutches in oil
Ratio	1.19 to 1 reduction
Input	From torque converter
Output	Direct to drive axle ring gear
Clutches	2 self-adjusting single cork-faced disks
Fluid	OE 10
Capacity (Includes drive axle and torque converters)	16 qt

(6) *Drive axle.*

Make	Rockwell-Standard
Reduction gearing	Double-reduction, ring and pinion plus internal-to-sun gears

Reduction overall .....17.27 to I
Brake (service) .....Hydraulic drum type, internal expanding shoes, self-adjusting
Brake (parking) .....Uses service brakes, lever operated through linkage to wheels
Brake drum size .....11.5 in. x 2.5 in.
Wheels .....Individually demountable disk type

(7) *Steering axle.*

Manufacturer .....Baker
King pin geometry.....Neutral

(8) *Power steering.*

Make.....Saginaw
Type .....Rotary valve
Power source .....Main hydraulic pump priority valve

(9) *Hydraulic system:*

Fluid capacity of reservoir.....121/2 gal.
Fluid .....OE 10
System relief valve setting.....1800 psi
Pump:
- Make.....Tyrone PVP2-15OAND
- Drive .....Direct from engine
- Type.....Gear

Tilt cylinders:
- Make.....Baker
- Type.....Double-acting

Hoist cylinder:
- Make .....Baker
- Type .....Single-acting 2-stage, pressure hoist gravity return

(10) *Electric system.*

Voltage .....12 volts de
Engine ignition system .....Delco-Remy battery-coil-distributor type; radio interference suppressed
Alternator
- Make and model .....Delco-Remy 1100858
- Ground polarity.....Negative

Voltage regulator
- Make and model .....Delco-Remy 1116381

Spark plugs
- Thread size .....14 mm
- Gap .....0.025 in.

Distributor
- Make and model .....Delco-Remy 1112673
- Rotation (top view) .....Counterclockwise
- Dwell angle.....31°-34°
- Point gap.....0.021 in.

Starter motor
- Make and model .....Delco-Remy 1107244

Wiring diagram see figure 1-7.

(11) Maintenance and Operating Supplies. Refer to appendix C for a complete list of Maintenance and Operating Supplies required for initial operation.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE ON RECEIPT OF MATERIAL

2-1. General

a. On receiving a new truck, organizational maintenance must unpack, inspect and service it as given in this section.

b. For shipping, the transmission is overfilled with four extra quarts of oil. As long as this extra oil remains, the truck can be pushed or towed up to a half mile at speeds less than two miles per hour. Do not operate the truck without draining the excess oil from the transmission.

c. .Any defects in the truck must be referred to the level of maintenance indicated in the Maintenance Allocation Chart appendix B.

2-2. Removal of Preservatives and Packaging Materials

a. Remove all tape, paper and other packing and wrapping materials from the truck and its separately packed components.

b. If forks are strapped to uprights for shipping, carefully cut the straps and remove forks for installation.

c. Wash preservative coating from truck parts with SD (solvent, dry-cleaning) or some suitable solvent such as kerosene or diesel fuel. Do not wash lubricant from mast parts.

2-3. Inspection

a. Check that everything on the packing list has been received.

b. Inspect truck exterior for obvious defects such as damaged paint, missing markings, or mutilated identification plates.

c. Raise engine compartment cover and inspect for oil or coolant leaks. Locate all fluid drains shown on the current Lubrication Order and check that they are in good condition and closed.

2-4. Servicing the Truck

a. Using table 3-1, Preventive Maintenance Checks and Services, and paragraph 3-7 as a guide, prepare the truck for service. This procedure will begin the cycle of regularly scheduled preventive maintenance.

b. Tires will have been over-inflated for shipping. Check tire pressure, and if necessary bleed them down to 100 psi inflation.

c. Transmission will have been overfilled before shipment. Check level and drain transmission down to correct level as shown on dipstick, using the method given on the current Lubrication Order.

Section II. CONTROLS AND INSTRUMENTS

2-5. General

Arrangement of controls and instruments on the truck generally follow standard industrial truck practice. An operator with experience in operating other models of fork lift trucks will be able to operate this truck with little instruction. However, each operator must demonstrate his ability to use the truck efficiently before being assigned to work with it.

2-6. Controls

a. Engine Choke Control. On the instrument panel see figure 2-1. Used principally when starting a cold engine.

b. Steering Wheel (fig. 2-1). The horn button is in the center. Press to blow horn.

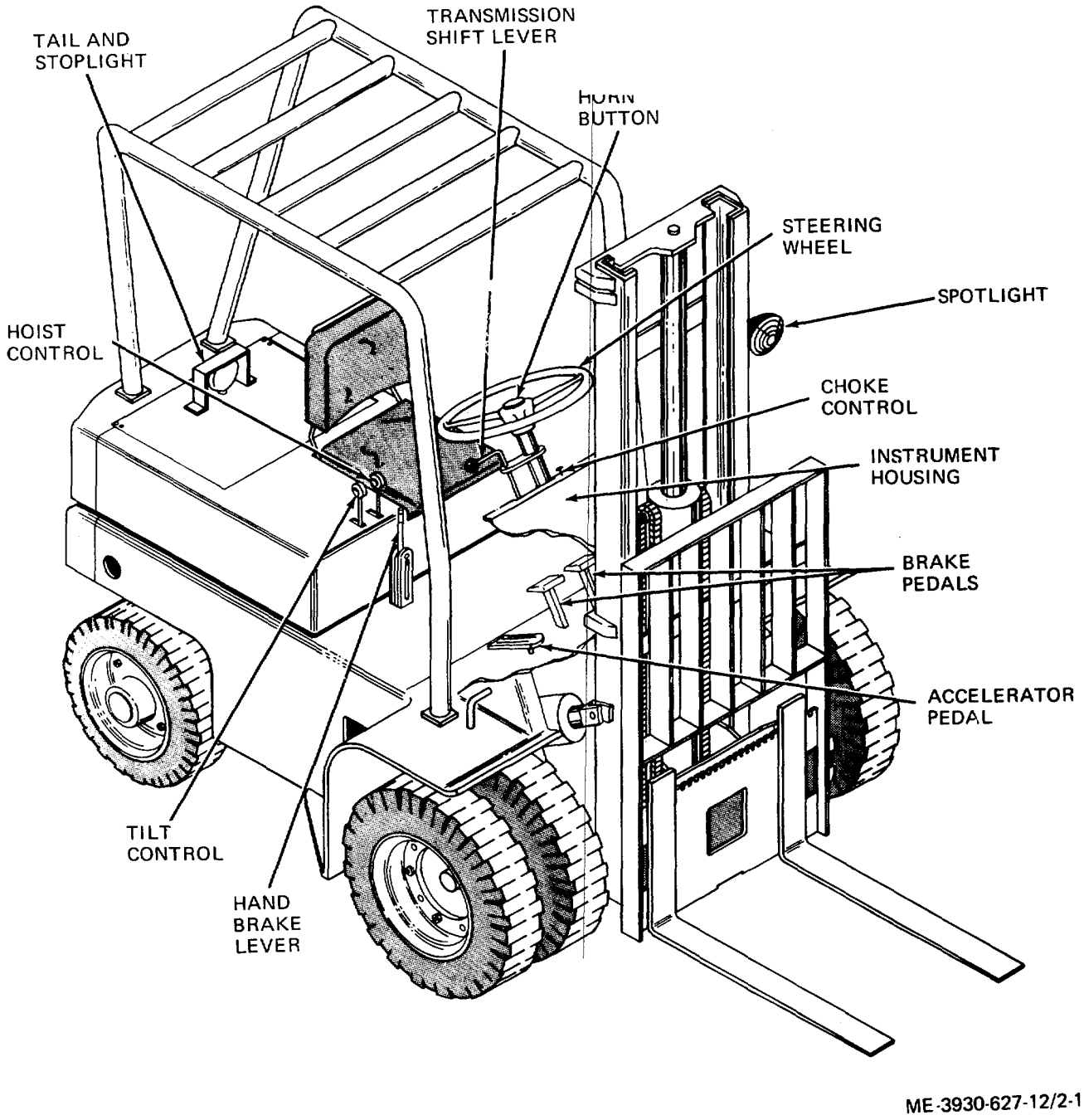


Figure 2-1. Controls

c. Hand Brake Lever. This control actuates, through supplementary mechanical linkage, the service brake shoes at the wheels. The hand brake is primarily a parking brake. If the truck's foot brake is pressed during application of the parking brake, less effort will be required at the handle for a given degree of brake application.

d. Accelerator Pedal. For controlling engine speed.

e. Double Brake Pedal. Pressure on either pedal operates the inching valve and applies the brakes, as follows:

(1) If the transmission is in either drive range slight brake pedal travel bypasses a portion of

Clutch Apply pressure to the applied clutch, permitting clutch slippage for close quarter inching operations.

(2) Further pedal travel dumps all Clutch Apply pressure, effectively neutralizing the transmission even if the selector is in a Drive position. The operator can then inch in under a load, pick it up without shifting to neutral, and take it away with minimum operation of controls. Further pressure on the pedal beyond inching applies the brakes.

f. Shift Lever. This lever is used to shift the transmission into FORWARD, NEUTRAL, OR REVERSE. Design of the transmission permits power shifting between FORWARD and REVERSE at any speed, without using brakes, if the operation being performed requires it.

g. Hoist Control Lever. With the truck engine running, drawing this lever rearward directs hydraulic pressure to the hoist cylinder to raise the forks. In center position, the hoist cylinder is locked in whatever position it was at the time the control was placed in that position. Moving the lever forward releases the hydraulic fluid in the hoist cylinder to permit lowering the forks by gravity. The control can be manipulated by the operator to select the rate of raising or lowering as desired.

h. Tilt Control Lever. When moved forward, this control tilts the uprights and forks OUT to facilitate picking up certain types of load, and IN (when moved rearward) for security in carrying a load.

2-7. Instrument Panel (fig. 1-6)

a. Ignition Switch. Turns on ignition and energizes dash instruments.

b. Starter Switch Button. When pressed, will energize the starter, provided:

(1) Ignition is on.
(2) Engine is not running.
(3) Transmission lever is in NEUTRAL.

c. Light Switch. Operates spotlight and taillight.

d. Hourmeter. Records and displays total engine operating time on dial.

e. Fuel Gage. Shows fuel quantity in tank when ignition is on. Scale, E - 1/4 - 1/2 - 3/4 F.

f. Ammeter. Shows current flow to battery (+c from alternator when charging or from battery (except starter current) when current demand exceeds alternator output. Scale: -50, -0, +50 amperes. Indication depends on engine speed, battery charge, electrical load.

g. Engine Temperature. Shows engine head temperature in degrees F. Normal steady state reading, 1600F-1800F. Scale, 1000F--212°F.

h. Engine Oil Pressure. Shows pressure of lubricating oil when engine is running. Normal reading, engine warmed up, 20-40 psi at governed speed, 7-10 psi at idle.

Section III. OPERATION UNDER USUAL CONDITIONS

2-8. Starting the Fork Lift Truck

a. Perform daily preventive maintenance services (table 3-1).

b. Position shift lever in NEUTRAL (center of fore and aft travel) position. Shift lever must be in NEUTRAL to close neutral safety switch and complete starter circuit.

c. Draw out engine choke control fully, unless engine is warm.

d. Turn on ignition switch (fig. 1-6).

e. Press starter button instrument housing to crank engine until it starts, while holding throttle slightly open with accelerator pedal.

f. As soon as engine starts, push choke control back in as far as possible without causing rough running of the engine. As the engine warms up, return choke control to fully IN position. It is required only in starting and when cold, and possibly during engine warm-up.

Note. If engine cannot be started in fifteen seconds of cranking effort, discontinue trying to start it and determine the reason for failure to start.

g. When the engine starts, note that oil pressure gage on instrument cluster indicates at least 35 pounds pressure. If pressure is low or erratic, stop engine immediately and check oil level.

h. To stop engine, turn off ignition switch.

2-9. Operating Procedures and Techniques

a. Shifting. Shifting from forward to reverse or reverse to forward is accomplished by moving the transmission shift lever in the direction the operator wishes to travel. The vehicle can be power shifted from forward to reverse or vice versa. It is not necessary to bring the truck to a complete stop to perform forward-reverse shifting operation.

b. Service Brakes and Inching Control. Inching control provides a method of partially or completely disengaging engine power from the drive axle to obtain high engine rpm for rapid lifting speeds while inching the vehicle. Two service brake pedals, on a common shaft and located for either left or right foot operation operate the inching valve. The operator can use his left foot for operating the inching control and brake, and his right foot to accelerate the engine for high speed lifting. The first part of the brake pedal stroke controls inching. Depressing pedal reduces oil pressure to the clutches. Further depressing of the pedal cuts off oil pressure and actuates the service brakes.

2-10. General Loading and Driving Procedures

a. Loading. Observe the following procedures and precautions:

(1) Never, under any circumstances, attempt to operate a fork lift truck with a load so heavy that steering becomes uncertain.

(2) Have forks correctly spaced for pallet.

(3) Approach pallet with forks at correct height to enter pallet. As forks enter pallet, shift into reverse direction.

(4) Position the forks so that load is centered.

(5) Spread the forks apart when carrying wide loads.

(6) Never attempt to use only one fork to lift a load. Using one fork may damage the mast.

(7) Get the load as far back on the forks as possible. If the load is placed out near the tips of the forks, the rated capacity of the truck will be greatly reduced. This procedure is especially important with long loads, to prevent loss of traction on the trailing wheels.

(8) Always tilt the mast back to cradle the load before hoisting it.

(9) Tilt the mast out, and slide the forks under the load, then tilt mast in before hoisting.

b. Steering. Observe the following procedures and precautions:

(1) Make turns smoothly and gradually. Avoid sudden turns which may cause loss of control or spilling of the load.

(2) A loaded fork truck usually steers easier than an empty one. The truck operator should accustom himself to these changes in steering.

(3) Do not go around corners too fast, especially when there is no load on forks, as truck may overturn.

(4) When turning sharp corners, start from the inside corner rather than from the middle of the aisle.

(5) The operator must accustom himself to the peculiarities of rear wheel steering. Make allowance for the tail swing and free turning tendencies of the vehicle.

c. Driving and Transporting the Load. Observe the following procedures and precautions:

(1) While traveling, keep the mast tilted back.

(2) Raise the load only high enough to clear obstructions while traveling. Do not carry the load so high as to cause instability.

(3) Back the fork lift truck down steep inclines so -hat the load will not slip off the forks.

(4) Always reduce speed gradually, as sudden stops are unnecessarily hard on the truck, and the load may fall forward.

(5) Watch instruments to insure proper engine operation.

(6) Always set parking brake when leaving the truck.

(7) Never stand or pass under elevated loads.

(8) Check the height of doorways for adequate clearance.

(9) Loaded or empty, drive with the forks raised to about six inches ground clearance, and with the boom tilted backwards.

(10) Never put arms or legs between the uprights.

(11) Transport no unauthorized riders.

(12) Report any defect in the truck or its operation to responsible authority immediately. Do not continue to use a truck with a defect unless specifically authorized to do so.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-11. Operation in Extreme Cold (Below 0° F)

a. Fill the engine cooling system with Arctic type antifreeze as specified in appendix C.

b. Keep battery at full charge. If necessary recharge battery at slow rate between shifts.

c. If possible, store truck in a heated, or at least sheltered place. If truck must be left outside between work shifts, take battery out of truck and' keep it in a warm place until needed.

d. Lubricate truck according to the current lubrication order.

2-12. Operation in Tropical Area

a. Maintain engine cooling system at top efficiency at all times. Keep fan belt snug and radiator clean and free of debris.

b. When used at or near salt water, hose down the truck with fresh water after use, and lubricate chassis and mast more frequently.

c. Inspect for chipped paint and beginning of corrosion and fix any defects promptly.

2-13. Operation in Dusty or Sandy Areas

a. Clean air filter as often as required, disregarding normal intervals.

b. Frequently check quality of lubricant on mast parts. If mast is contaminated with sand or grit, steam clean, and relubricate.

c. Store truck in covered building when possible, or cover with tarpaulin or sheet plastic.

2-14. Operation at High Altitudes

a. Some power loss and increased fuel consumption will take place at higher altitudes. This

can only be compensated for by leaning out the carburetor air/fuel mixture ratio. Should this adjustment require installation of a new jet, refer the truck to General Support Maintenance.

b. Coolant boiling point is lower at high altitudes. If boiling becomes a problem, and the engine is not overheating, Organizational Maintenance can install a lower temperature thermostat.

2-15. Operation in Mud, Snow and Ice

a. Install truck tire chains on the dual drive wheels.

b. Even with chains installed, be very careful when driving on slippery ramps and bridge plates between platform and box cars or trucks.

c. Particularly when carrying a capacity load, make turns on ice as slowly as practical, because of reduced grip of steering tires.

CHAPTER 3

OPERATOR'S MAINTENANCE INSTRUCTIONS

Section I. BASIC ISSUE ITEMS

3-1. Equipment
Publications, equipment and operating supplies issued with or authorized for the fork lift truck are listed in the basic issue items list, appendix C.

Section II. LUBRICATION INSTRUCTIONS

3-2. General
The lubrication of the truck is the responsibility of organizational maintenance personnel of the using organization.

3-3. Operator Responsibilities
The operator must be alert to signs of problems due to lack of lubrication. Report loss of engine oil pressure, unusual noises, sticking of lift mechanism and like conditions immediately to the proper authority.

Section III. PREVENTIVE MAINTENANCE SERVICES AND CHECKS

3-4. General
To insure that the truck is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. Defects discovered during operation of the truck shall be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if trouble is noted during operation which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded with the corrective action taken on DA Form 2404 at the earliest possible opportunity.

3-5. Daily Preventive Maintenance Services
Table 3-1 is a tabulated listing of preventive maintenance services which must be performed by the operator.

Table 3-1. Preventive Maintenance Checks and Services

Operator Maintenance Category *Daily*

Interval and sequence No.			Item to be inspected	Procedure	Paragraph reference
Before operation	During Operation	After operation			
1			Drive belt tension and condition.	Check for 1/2 inch deflection at firm thumb pressure midway between alternator and fan pulleys. Check for damage or aging.	
		2	Tires inflation and condition.	Check for 100 psi inflation and wear, cuts, or imbedded objects.	2-4
3			Oil tank level	Check and maintain level. Refer to L.O.	
4			Transmission oil	Check and maintain level.	3-7
5			Fire extinguisher	Check charge and for broken seal.	
	6		Instruments	Note readings. Report abnormal indications promptly.	2-7 3-3
7	7		Brakes	Check operation, and pedal for 3/8 inch to 5/8 inch free travel.	2-6
8			Fuel tank	Add fuel as needed.	3-7
		9	Battery	Check and maintain electrolyte 3/8 inch above plates.	3-7
10			Radiator	Check and maintain coolant level.	
11			Horn	Check for operation.	
12			Hand brake		
13			Engine	Check oil level, fill as required by LO.	
14			Lights	Check for operation.	

SECTION IV. TROUBLESHOOTING

3-6. Operator Responsibilities

The operator will report to the proper authority any deficiencies noted before, during, or after operation. Report any strange noises or subnormal operation immediately and as accurately as possible. The operator is authorized to perform the jobs listed in section V following.

SECTION V. MAINTENANCE OF COMPONENTS

3-7. Operator's Maintenance

a. Engine. Check oil level by dipstick. Add oil as needed. Use only oil specified in the current lubrication order.

b. Engine Air Cleaner. Remove filter element, clean surface with gentle compressed air blast and soft brush. Replace when necessary.

c. Fuel Tank. Fill as needed with specified gasoline.

d. Radiator. Check and maintain coolant level.

e. Battery. Check electrolyte level. Add distilled water as needed to cover plates 3/8 inch.

f. Transmission. Check level with engine warm and idling. Add oil specified for local temperatures as needed to bring level to mark on dipstick.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE ON RECEIPT OF THE TRUCK

4-1. Service on Receipt
The truck will have been largely prepared for use before shipment to the using organization. Minor services and a complete periodic inspection are the responsibility of receiving organizational maintenance. Refer to paragraph 2-4 for a list of these services.

SECTION II. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

4-2. Tools and Equipment
Equipment issued with the truck is listed in the basic issue items list, appendix B. Tools needed for organizational maintenance are those commonly found at organizational maintenance shops.

4-3. Special Tools and Equipment
No special tools or equipment are needed for organizational maintenance of the equipment.

4-4. Maintenance Repair Parts
Repair parts are listed and shown in the repair parts list for the truck, T'M 10-3930-627-20P.

SECTION III. LUBRICATION INSTRUCTIONS

4-5. General
Lubrication order LO 10-3930-627-12 prescribes lubrication maintenance of the truck; compliance with the instructions is mandatory at all levels of maintenance. The order includes lubrication instructions for normal and abnormal conditions and temperatures. If a truck is received without a lubrication order, the using organization must requisition a lubrication order through normal channels in accordance with AR 310-1.

4-6. Lubrication Order
The lubrication order is published separately and furnished as a basic issue item. Refer to appendix C.

SECTION IV. PREVENTIVE MAINTENANCE SERVICES

4-7. General
To be sure that the truck is ready for use at all times, inspect it regularly to find defects before they result in serious damage. The preventive maintenance services are listed and described in table 4-1. Defects noticed during operation of the fork lift truck will be noted for future correction, to be made as soon as operation has ceased. Stop truck immediately if a deficiency is noted which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded with the corrective action taken on DA Form 2404 at the earliest possible opportunity.

4-8. 250 Hour Preventive Maintenance Services

a. This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by organizational maintenance personnel at 250 hour intervals.

b. The services listed indicate the minimum requirements. Refer to table 4-1 for the 250 hour preventive maintenance services.

Table 4-1. Preventive Maintenance Checks and Services

Organizational Maintenance Category		250 Hour Schedule	
Sequence No.	Item to be inspected	Procedure	Paragraph references
1	Drive belt	Proper adjustment is ½ full deflection midway between pulleys. Replace a worn, cracked or frayed belt.	4-30
2	Spark plugs	Replace spark plugs that have cracked insulators or burned electrodes. Clean and set spark plug gaps for 0.025 inch. Torque spark plugs to 25 to 30 foot-pounds. Replace leads that are frayed or broken. Clean and tighten lead connections.	4-36
3	Distributor	Replace pitted or burned contact points. Proper gap adjustment is 0.022 inch. (Check adjustment every 500 hours}.	4-35
4	Fire Extinguisher	Inspect for broken seal. The dry chemical type must be weighed every 6 months. If the weight has decreased to less than that specified on cylinder or the pressure is below 125 psi the extinguisher must be replaced.	
5	Tilt cylinder	Check for leaks and insecure mounting. Replace a defective cylinder. Adjust as necessary.	4-54
6	Lights	Check for burned out lamps or defective leads. Replace defective lamps or leads.	
7	Lift chains	Inspect for cracked, broken or worn links. Replace a defective chain. Adjust as necessary. Reference current L.O.	4-55
8	Lift cylinder	Inspect for leaks and insecure mounting. Refer discrepancies to direct support.	
9	Controls and Instruments	Inspect for damage and loose mounting. With unit operating, check for proper operation.	2-7 3-3
10	Brake and Inching pedal	Check for strong pressure when brake pedal is applied. Proper pedal free travel is 3/8 to 5/8 inch. Bleed brakes if necessary. Inspect cylinder and lines for leaks. Add fluid as required.	4-43
11	Master cylinder	Reference current LO. Clean fill plug vent. Replace a defective cylinder or leaking line. Inspect operation. Adjust as necessary.	4-42
12	Handbrake	Add fuel as required. Tighten loose mounting. Replace leaking	4-41
13	Fuel tank	fuel tank. Replace defective cap gasket. Clean cap vent. Clean fuel pump strainer screen. Install new gasket.	4-25
14	Fuel Strainer	Tighten loose cables and mountings. Remove corrosion. Fill to	4-26
15	Battery	3/8 inch above the plates. Clean venthole in filler cap before installing. In freezing weather run engine minimum of 1 hour after adding water. Replace a cracked or leaking battery. Change oil and replace filter. Reference current LO.	3-7 4-33
16	Engine oil level gage	Proper coolant level is 1 inch below filler neck. Replace cracked	LO.
17	Radiator	or frayed hose. Replace defective radiator. Remove obstructions in the air passages. Tighten all mounting and leaking connections. Lubricate in accordance with current LO.	3-7
18		*Note.* During operation observe for any unusual noise or vibration.	

Section V. TROUBLESHOOTING

4-9. General

This section provides general guidance in troubleshooting the truck. Table 4-2 lists some possible problems which might occur, with the probable cause, and possible remedy for each. Troubleshooting successfully will basically depend on the skill, experience and personal observations of the man checking the truck. Remember that a single defect may cause several symptoms at the same time. Also. a single symptom may have one of several possible causes. Use table 4-2 mainly as a checklist, rather than as a sole source of information while troubleshooting. Entries in table 4-2 assume trouble has developed in normal use of the truck, Consider also accumulated time since new or since last overhaul, and possible poorly done maintenance work in deciding the most probable cause.

Table 4-2. Troubleshooting

Malfunction	*Probable cause*	*Corrective action*
1. Starter does not crank engine.	*a.* Discharged battery.	*a.* Charge battery.
	b. Bad starter	*b.* Replace starter, paragraph 4-34.
	c. Loose or dirty battery cable connections.	*c.* Clean and tighten connections, paragraph 4-33.
2. Starter cranks, engine will not start.	a. Ignition failure.	*a.* Check ignition & repair defects noted, paragraph 4-35, 4-36, 4-37.
	b. Fuel system failure.	*b.* Check fuel pump. paragraph 4-26. carburetor paragraph 4-22. and fuel supply. Correct as needed.
	c. Carburetor over-or underchoked.	*c.* If overchoked. gas will drip from carburetor. Wait five minutes and start without using choke.
3. Engine lacks power, exhaust color, and idle are normal.	*a.* Governor setting	*a.* Adjust governor, paragraph 4-23.
	b. Late ignition timing.	*b.* Correct ignition timing, paragraph 4-35.
	c. Fuel supply restricted.	*c.* Check fuel line and shut off valve., fuel pump, paragraph 4-26, and adjustment of carburetor. Correct as needed.
4. Engine lacks power, black exhaust smoke and strong odor of gasoline.	Carburetor flooding	Replace carburetor, paragraph 4-22.
5. Engine backfires on acceleration.	*a.* Lean fuel mixture.	*a.* Adjust carburetor, or replace carburetor, paragraph 4-22 or fuel pump, paragraph 4-26 as needed.
	b. Sticky valves.	*b.* Refer to direct support maintenance.
	c. Late ignition timing.	*c.* Advance ignition timing, paragraph 4-35.
6. Engine overheats.	*a.* Coolant level low.	*a.* Add required coolant.
	b. Water pump bad.	*b.* Replace pump, paragraph 4-30.
	c. Radiator clogged.	*c.* Replace radiator, paragraph 4-30.
7. Ammeter shows low charging rate.	*a.* Battery fully charged.	*a.* Normal. No action necessary.
	b. Drive belt loose.	*b.* Tighten belt, paragraph 4-30.
	c. Alternator or regulator bad	*c.* Replace defective unit, paragraph 4-31,
8. Ammeter shows high charging rate, battery charged.	Regulator bad.	Replace regulator, paragraph 4-32.
9. Neither head nor taillight will light.	a. Bad switch.	*a.* Replace switch.
	b. Blown *fuse.*	*b.* Replace fuse.
	c. Burned out lamps.	*c.* Replace lamps.
10. Brakes do not release.	Bad brake master cylinder.	Replace master cylinder, paragraph 4-40
11. Spongy or soft brake pedal feel.	Air in brake hydraulic system.	Bleed brakes.

Table 4-2. Troubleshooting-Continued

Malfunction	*Probable cause*	*Corrective action*
12. Hard brake pedal.	a. Glazed linings.	*a.* Reline brakes, paragraph 4-41.
	b. Linings do not fit drums at all points.	*b.* Refer to direct support for drum or lining grinding.
13. Excessive pedal travel.	*a.* Linkage adjustment.	*a.* Adjust linkage, paragraph 4-42.
	b. Low on fluid.	*b.* Add specified brake fluid.
14. Brakes pull to one side.	Oil or grease on drum or lining.	Check and correct source of oil, then clean drum and replace lining, paragraph 4-41.
15. Truck will not lift rated load.	*a.* Worn hydraulic parts.	a. Refer to direct support maintenance.
16. Truck lifts, but will not lower. load.	Worn or plugged hydraulic parts.	Do not move truck unnecessarily. Block load in position and refer to direct support maintenance.

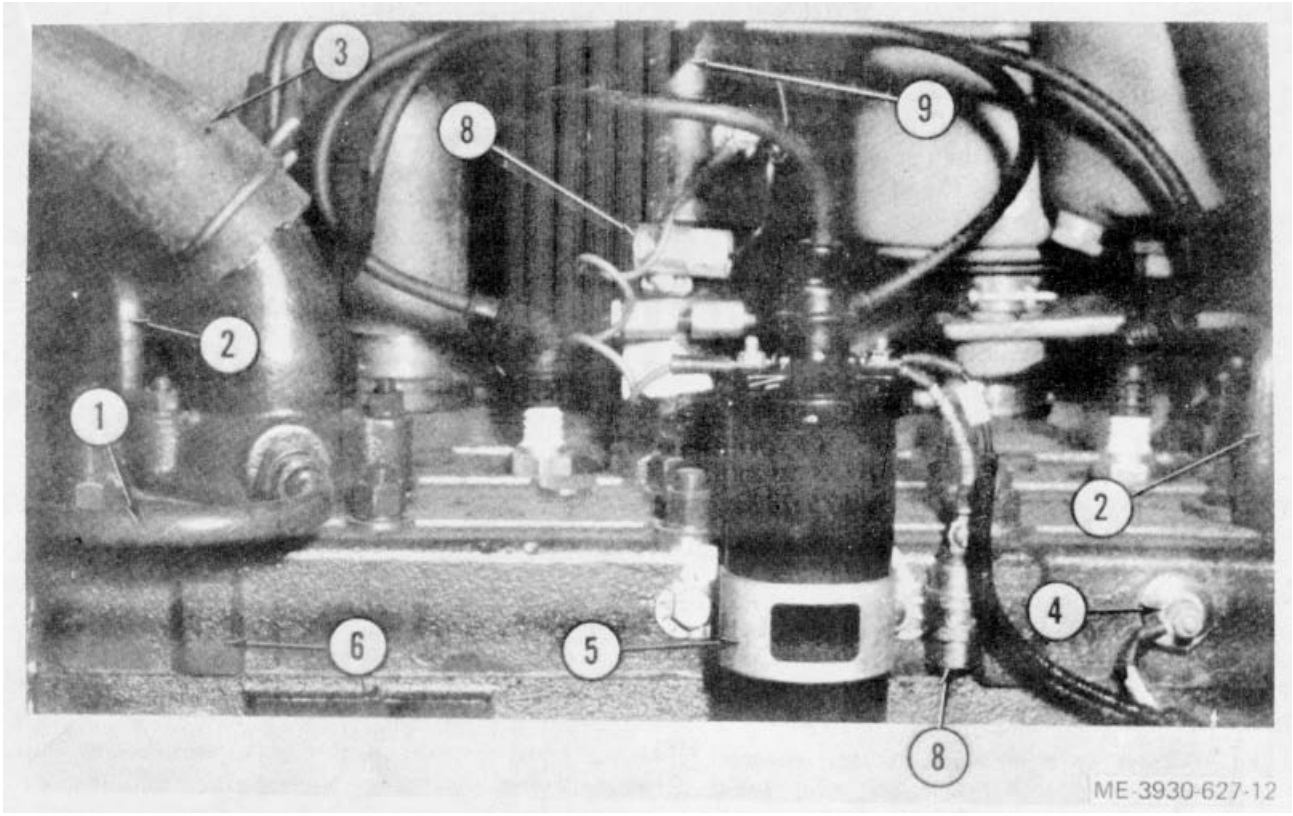
Section VI. RADIO INTERFERENCE SUPPRESSION

4-10. Methods Used to Obtain Suppression

Possible sources of radio interference on the truck are the ignition and charging systems. In addition to the inherent shielding of the steel truck structure, additional suppression is obtained by using a resistor in the ignition secondary circuit, a capacitor across the ignition primary circuit, and a capacitor on the switch terminal of the alternator voltage regulator.

4-11. Interference Suppression Components

The interference suppression components are one 10,000 ohm (nominal rating) suppression resistor (7, fig. 4-1) and two 0.1 microfarad capacitors (8). Each end of the resistor is fitted with recessed brass wood screw inserts, into which the cut ends of the coil-to-distributor high tension cable are installed. One capacitor is connected to the switch side coil primary terminal and to ground. One capacitor is connected to the switch terminal of the alternator voltage regulator and to ground.



1. Tube, recirculating
2. Eye, lifting
3. Hose, elbow to radiator
4. Transmitter, engine temperature
5. Support, coil mounting
6. Head, cylinder
7. Suppression resistor
8. Suppression capacitors

Figure 4-1. Engine, right side view.

4-12. Replacement of Suppression Components

Replacement of these components is given in the maintenance paragraphs (para 4-35 and 4-37) describing ignition maintenance.

4-13. Testing of Suppression Components

a. Resistor. Measure with a low voltage ohmmeter, the resistance of the resistor. The resistor will do its job within wide tolerances. A reading above 2000 ohms is satisfactory.

b. Capacitors. Test with capacitor tester. These units are rated similarly to ignition condensers and can be tested with the same equipment and procedure.

Section VII. MAINTENANCE OF THE ENGINE

4-14. Inspection

a. Raise the engine cover, and visually inspect the engine for general condition. If the engine has many hours of operation since new or since major maintenance, closely check tightness of attaching parts, and look for general wear that might lead to early failure.

b. Check edges of gasketed surfaces for fluid leaks.

c. Make the specific inspections of engine systems given in the following sections.

d. Report any troubles to direct support maintenance for correction, if the repair is not authorized for organizational maintenance.

4-15. Test

Use all test and diagnostic equipment available to organizational maintenance to detect actual or potential troubles. Perform all tests as instructed by the maker of the test equipment used.

4-16. Cylinder Head

The cylinder head contains the fuel combustion chambers and the cored passages for water flow. Refer to figure 4-1 and remove the cylinder head as follows:

a. Removal.

(1) Drain cooling system.

(2) Remove bolts and lockwashers and remove coil mounting support (5, fig. 4-1) with coil from side of cylinder head. Capacitor is removed in this procedure.

(3) Remove distributor from cylinder head (para 4-35).

(4) Disconnect wire at engine temperature transmitter (4).

(5) Remove water pump to thermostat elbow (housing) recirculating tube (1).

(6) Loosen hose clamp and disconnect elbow to radiator hose (3) at elbow.

(7) Remove lifting eyes (2) from cylinder head studs.

(8) Remove cylinder head stud nuts and flat washers and remove cylinder head (6) and gasket from engine block.

(9) Remove stud nuts and lockwashers and remove elbow (housing) and thermostat from cylinder head.

(10) Remove engine temperature transmitter from the cylinder head.

(11) Remove spark plugs.

b. Cleaning and Inspection.

(1) Remove all carbon from combustion areas, using a scraper and wire brushes.

(2) Clean the cylinder head thoroughly with SD.

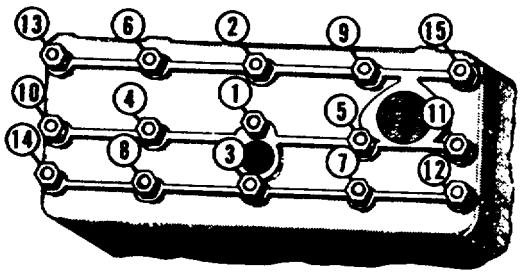
(3) Make sure that gasket contact surfaces on the head and block are clean, smooth, and flat.

(4) Inspect the head for cracks and holes. Check flatness with straightedge and feeler gage in three positions lengthwise and five crosswise. The maximum permissible is 0.004 inch low in the center lengthwise, gradually decreasing towards the ends, or 0.003 inch crosswise or in localized low spots.

c. Installation.

(1) Reverse procedures in *a* above using a new gasket.

(2) Tighten each cylinder head nut to 70 to 75 foot-pounds torque, following the sequence in figure 4-2.



ME-3930-627-12/4-2

Figure 4-2. Cylinder head tightening order.

4-17. Valves and Valve Cover

a. Removal of Cover.

(1) Remove air cleaner (para 4-24).

(2) Remove carburetor (para 4-22).

(3) Remove fuel pump (para 4-26).

(4) Remove two valve cover mounting screws (8, fig. 4-5) with gaskets and remove cover and gasket from engine.

b. Inspection. Inspect valve springs, locks, seats, (retainers) and caps as follows. If defective parts are found, report to proper authority.

(1) Inspect springs for breaks, cracks, fatigue, and proper seating on the seats (retainers) and engine block.

(2) Inspect seats (retainers) and locks for placement, breaks, and cracks.

c. Valve Adjustment (fig. 4-3).To position No. 1 cylinder valves for adjustment, proceed as follows:

(1) Remove spark plugs.

(2) Place thumb over No. 1 spark plug hole and crank engine with starting motor a little at a time by momentarily pushing starter button. When the No. 1 position starts up on its compression stroke, pressure will be felt against the thumb. When pressure is felt, stop cranking engine with starting motor, remove thumb and continue cranking engine by hand while observing timing pointer. When timing pointer and top dead center mark are aligned, the No. 1 cylinder valves are in position for adjusting.

(3) Slide a 0.014-inch feeler gage between the valve lifter adjusting screw and the valve stem cap. A slight drag should be felt with the feeler gage when the clearance is correct.

(4) To increase clearance, hold valve lifters with a 9/16-inch tappet wrench and turn the adjusting screw clockwise with a ’/2-inch tappet wrench.

(5) To decrease clearance, hold the valve lifter and turn the adjusting screw counterclockwise.

(6) Following firing order, turn crankshaft one-half revolution and adjust valves for No. 3 cylinder. Turn crankshaft one-half revolution and adjust valves for No. 4 cylinder. Turn crankshaft one-half revolution and adjust valves for No. 2 cylinder.

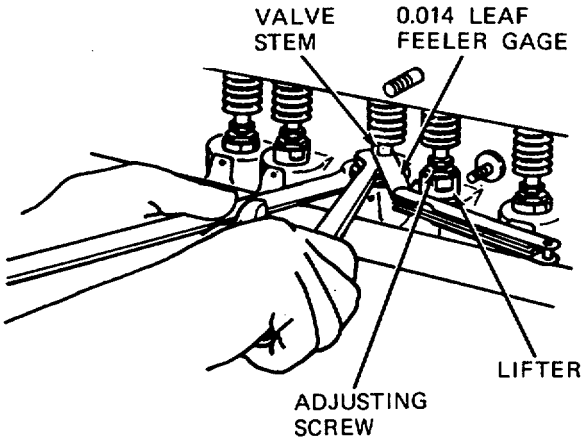


Figure 4-3. Adjusting valve clearance.

d. Installation of Cover.

(1) Clean the cover with SD.

(2) Reverse procedures in a above to install cover using a new gasket.

4-18. Compression Test

A compression test is made to determine the need of internal repairs before tune-up procedures are undertaken. This test will indicate the condition of the piston rings and valves. Compression pressure depends upon altitude, cranking speed, engine temperature, oil viscosity, compression ratio, and condition of engine. An engine without fairly even compression cannot be tuned properly. Make the test in the following manner:

a. Start engine and run until normal operation temperature is reached. Stop engine.

b. Remove all spark plugs after cleaning dirt or other foreign matter out of plug wells.

c. Remove and ground coil secondary wire from distributor cap to prevent accidental shocks while cranking engine.

d. Insert a compression gage in number one spark plug hole.

e. With both throttle and choke fully open, crank engine with the starting motor and record the highest reading obtained. Do not crank engine more than is necessary (six revolutions will be sufficient). Record readings on other cylinders in the same manner.

f. Compare pressure of the cylinders. Cylinder pressure should not vary more than 15 psi. Should one or more cylinders show low compression, pour enough light engine oil on top of piston with low compression to seal the rings and take another reading. If compression is appreciably increased in the cylinder so treated, piston or rings require replacement. If no change in compression occurs, check the valve mechanism. A low reading on two adjacent cylinders indicates the possibility of a leak from one cylinder to the other at the cylinder head gasket.

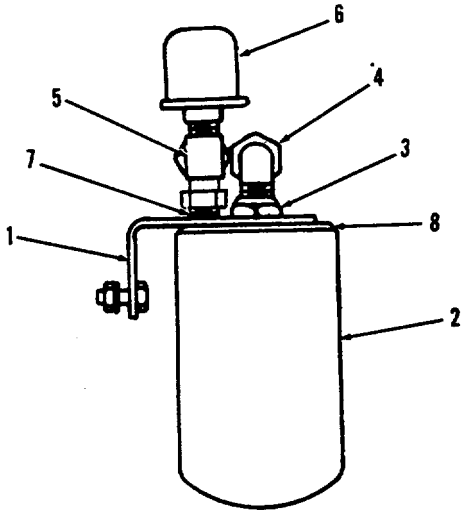
g. Install spark plugs and coil wire.

4-19. Crankcase Fluid Filter

a. Removal of Element.

(1) Turn spin-on filter element (2, fig. 4-4) counterclockwise.

(2) Remove gasket and element from base (8).



1. Bracket
2. Filter cartridge
3. Jam nut
4. Elbow
5. Tee
6. Pressure *sender*
7. Adapter
8. Base

Figure 4-4. Engine oil filter arrangement.

b. Installation of Element. Using new filter element, reverse removal procedures.

c. Removal of Filter.

(1) Disconnect hoses at filter.

(2) Loosen nut (3). Remove connector fittings 14 and 7.).

(3) Remove screws, lockwashers, and nuts securing filter bracket (1) to frame.

d. Cleaning and Inspection. Clean the filter base

with SD and inspect the filter assembly for cracks, broken base, or stripped threads.

e. Installation of Filter. Reverse procedures in c above using a new filter element and cover gasket. On installation, make certain that the inlet line is connected to the center of the filter.

4-20. Intake and Exhaust Manifold.

a. Removal.

(1) Remove air cleaner and support (para 4-24).

(2) Loosen exhaust pipe clamp (3, fig. 4-5) to permit lifting of elbow (2) to clear elbow mounting studs (1).

(3) Remove stud nuts (9) and washers at the exhaust elbow on manifold.

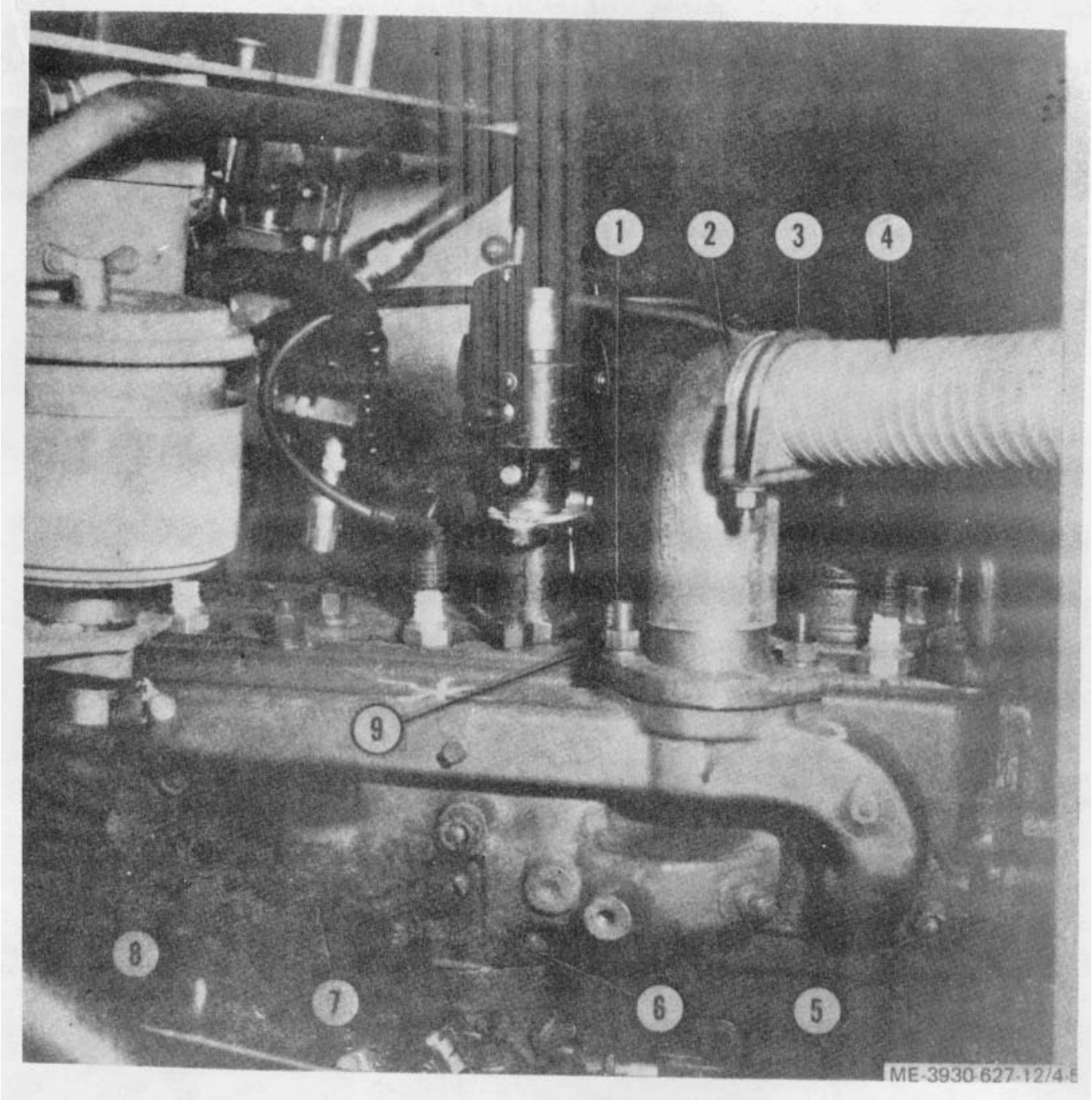
(4) Lift exhaust pipe with elbow from exhaust manifold. Separate elbow from exhaust pipe (4). Remove gasket from elbow.

(5) Remove carburetor mounting stud nuts (6) and lockwashers and remove carburetor from the manifold.

(6) Remove manifold mounting nuts (5) and washers.

(7) Lift manifold (7) out and off the studs and remove the manifold from the truck. Remove the gasket from the cylinder block.

(8) Remove studs and pipe plugs from the intake and exhaust manifold.



1. Stud
2. Elbow, exhaust
3. Clamp
4. Pipe, exhaust
5. Nut, stud
6. Nut, stud
7. Manifold, intake and exhaust
8. Screw, valve cover mounting
9. Nut, stud

Figure 4-5. Intake and exhaust manifold, installed.

b. Cleaning and Inspection. Clean intake and exhaust manifold with SD and inspect for cracks and warpage.

c. Installation.

(1) Reverse procedures in a above, using new gaskets.

(2) Be sure the intake and exhaust manifold is securely attached to engine before tightening exhaust elbow to manifold.

Section VIII. FUEL SYSTEM

4-21. General

The fuel system consists of a fuel tank, a mechanical fuel pump, a fuel gage, a carburetor air cleaner, an updraft carburetor, and a governor.

4-22. Carburetor.

a. Removal.

(1) Remove air cleaner from the truck (para 4-24).

(2) Disconnect carburetor-to-governor rod (6, fig. 4-6) at carburetor.

(3) Remove cotter pin from clevis pin and remove throttle rod clevis pin from clevis.

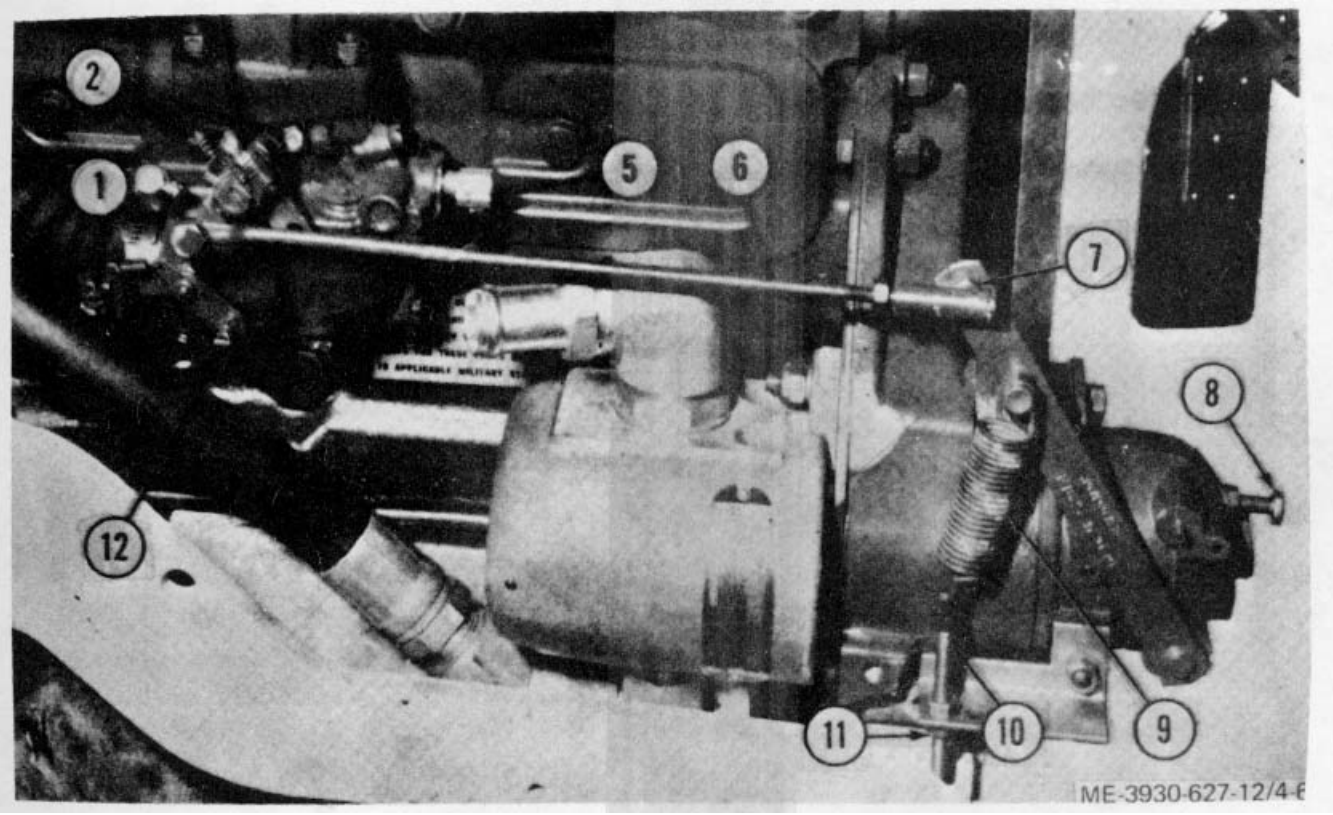
(4) Loosen the choke swivel screw (12).

(5) Loosen screw in choke bracket clip (1) and disconnect choke control from the carburetor.

(6) Disconnect fuel line at the connector (5).

(7) Remove stud nuts (3) and lockwashers that attach carburetor to intake manifold.

(8) Remove carburetor and gasket from the intake manifold.



1. Screw, choke bracket clip
2. Needle, idle adjusting
3. Nut, stud
4. Screw, clamp lever
5. Connector
6. Rod, carburetor to governor
7. Lever, governing
8. Screw, surge adjusting
9. Spring, governor
10. Screw, spring adjusting
11. Nut, adjusting
12. Screw, choke swivel

Figure 4-6. Governor, mounted on engine.

b. Installation. Reverse procedures in a above, using a new gasket. Connect choke control with button fully in and valve fully open.

c. Adjustment.

(1) Remove the pipe plug from the intake manifold.

(2) Install an adapter in the pipe plug opening and connect a vacuum gage to the adapter.

(3) Start the engine and allow it to warm up until normal operating temperature has been reached.

(4) Using a tachometer, adjust the engine to normal idling speed by means of throttle stop screw. Idling speed is 500 rpm.

(5) Turn the carburetor idle adjusting needle (2) to obtain the highest possible vacuum reading on the gage. The reading should be constant with very little movement of the hand on the vacuum gage.

4-23. Governor

a. Removal of Governor Linkage.

(1) Disconnect carburetor-to-governor rod (6, fig. 4-6) from governing lever (7).

(2) Loosen governor throttle clamp lever screw (4) at throttle shaft, then remove throttle clamp from shaft.

(3) Disconnect carburetor to governor rod from throttle lever.

(4) Remove clamp lever screw (4) and nut from clamp.

(5) Separate lever, clamp, spring, and screw.

(6) Disconnect governor spring (9) from governing lever and spring adjusting screw (10) and remove spring.

b. Installation of Governor Linkage. Reverse procedure in a above and adjust governor.

c. Adjustment of Governor.

(1) Place transmission shift lever in the neutral position and apply parking brake.

(2) Install a tachometer on the engine.

(3) Start and run engine until normal operating temperature is reached.

(4) Accelerate engine and check for no-load governed speed of 2, 600 rpm. Also check to see that there is no surge in full operating range of governor.

(5) If adjustment is needed, proceed as follows:

(6) Loosen externally relieved bolt lock nut (8) and back off on bolt so that it will have no effect on governor.

(7} To decrease engine speed, loosen speed control nuts (11); this decreases tension on spring. To increase speed, tighten speed control nuts.

(8) The externally relieved bolt (8) adjusts no-load surge. If governor surges, screw bolt in until surge is eliminated. Do not screw in far enough to increase rpm at idle speed. Lock bolt in position with locknut.

(9) Remove tachometer.

4-24. Air Cleaner

The truck uses a dry type paper element carburetor air cleaner. Service is limited to removing and cleaning or replacing the filter element. Proceed as follows:

a. Remove wingnut and top of air cleaner and lift out element.

b. Tap element on a hard surface to dislodge dust. If necessary, brush gently with a soft brush. Do not wash or oil this element.

c. If element shows signs of oil film or does not clean easily, replace it; otherwise reinstall element in air cleaner.

4-25. Fuel Tank

a. Removal.

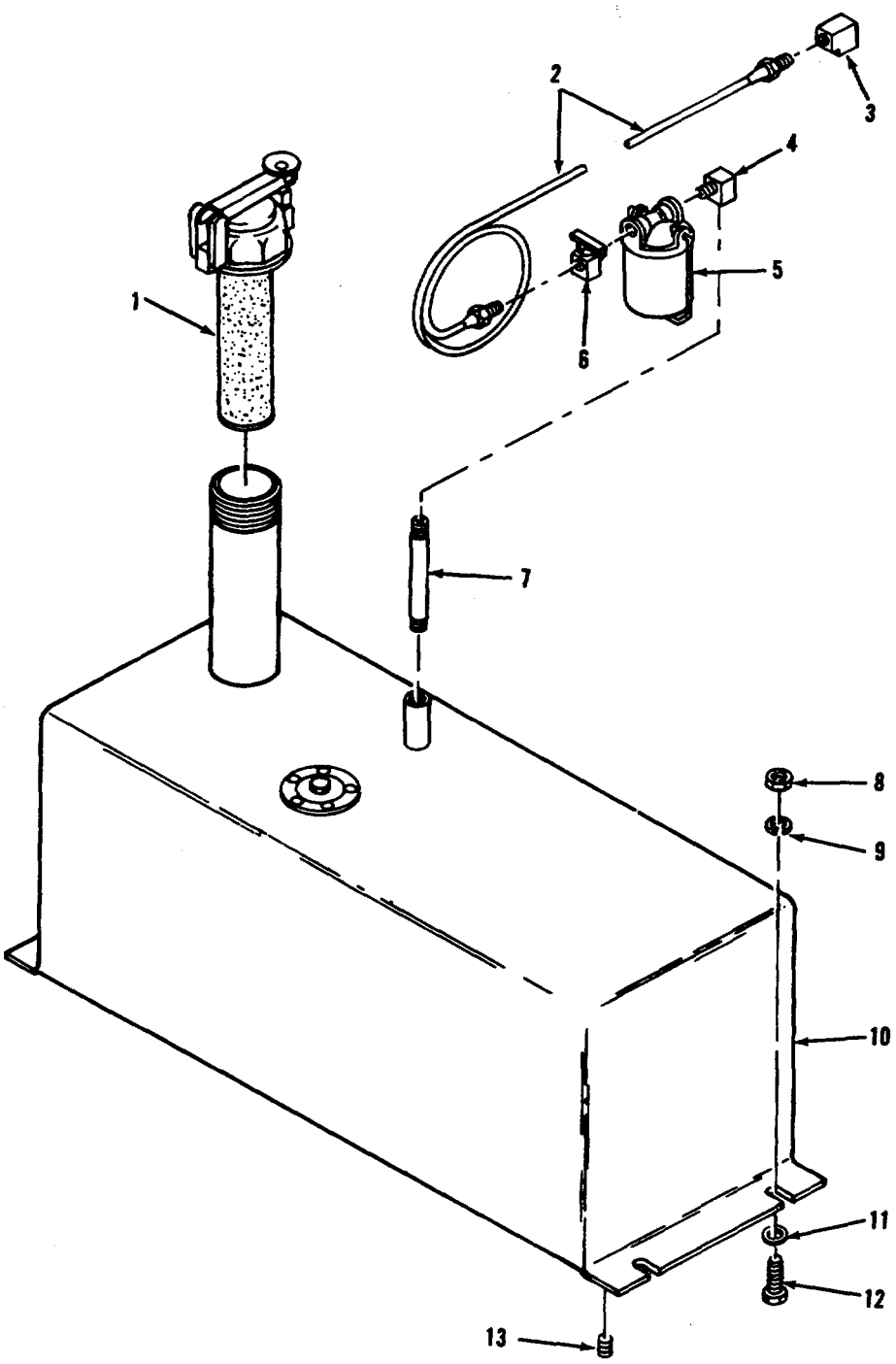
(1) Remove drain plug (13, fig. 4-7) to drain gasoline. Disconnect gage wire from transmitter.

(2) Remove gas cap (1).

(3) Remove fuel line (2) from elbow (3) and shutoff cock (6). Remove elbow and shutoff cock.

(4) Remove fuel filter (5), elbow (4), and nipple (7).

(5) Remove screw (12), nut (8), lock washer (9), and flat washer (11) attaching fuel tank (10).



1. Gas cap
2. Fuel line
3. Elbow
4. Elbow
5. Fuel filter
6. Shutoff cock
7. Nipple
8. Nut
9. Lock washer
10. Fuel tank
11. Flat washer
12. Screw
13. Drain plug

Figure 4-7. Fuel tank and lines.

b. Installation. Reverse procedure in a. above.

4-26. Fuel Pump

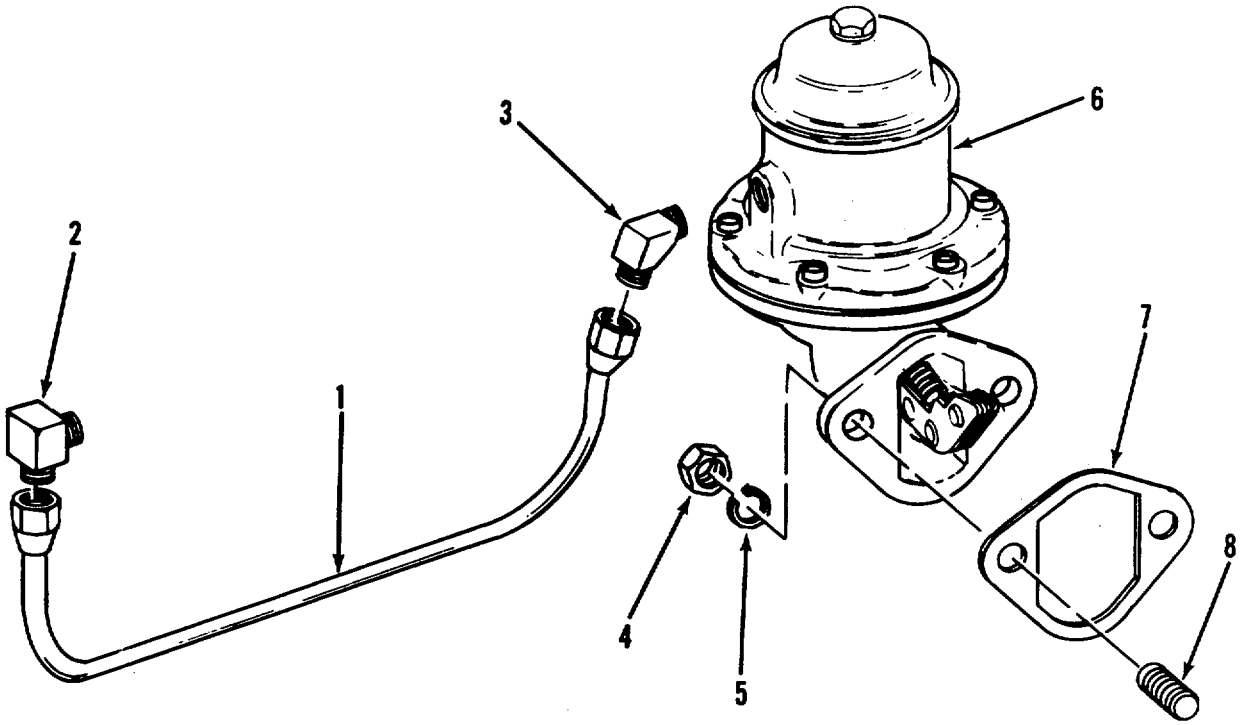
a. Removal.

(1) Close fuel shut off cock (6, fig. 4-10) at fuel filter (5).

(2) Disconnect fuel pump inlet line (2) at fuel pump.

(3) Disconnect pump to carburetor fuel line (12, fig. 4-11) at carburetor elbow (11) and fuel pump elbow (13). Remove elbow (13).

(4) Working from under truck, remove nuts (10), washers (9), from studs (8) and remove fuel pump (6) and gasket (7) from engine block.



1. Fuel line
2. Elbow
3. Elbow
4. Nut
5. Washer
6. Fuel pump
7. Gasket
8. Stud

Figure 4-8. Fuel pump.

c. Installation. Using new gasket, reverse removal procedure.

d. Pressure Test. To perform pressure test on the fuel pump, proceed as follows:

(1) Install a tee fitting in the line between the fuel pump and the carburetor.

(2) Install a pressure gage in the tee fitting.

(3) Install a tachometer on the engine.

(4) Run the engine at 1, 800 rpm.

(5) The pump pressure should register from 12 to 31/4 psi (pounds per square inch).

(6) If the static pressure reading is above the maximum number of pounds per square inch or below the minimum number, replace the fuel pump with a serviceable one.

(7) Remove the gage, tachometer and tee fitting.

4-27. Fuel Filter Assembly

a. Inspection and Cleaning.

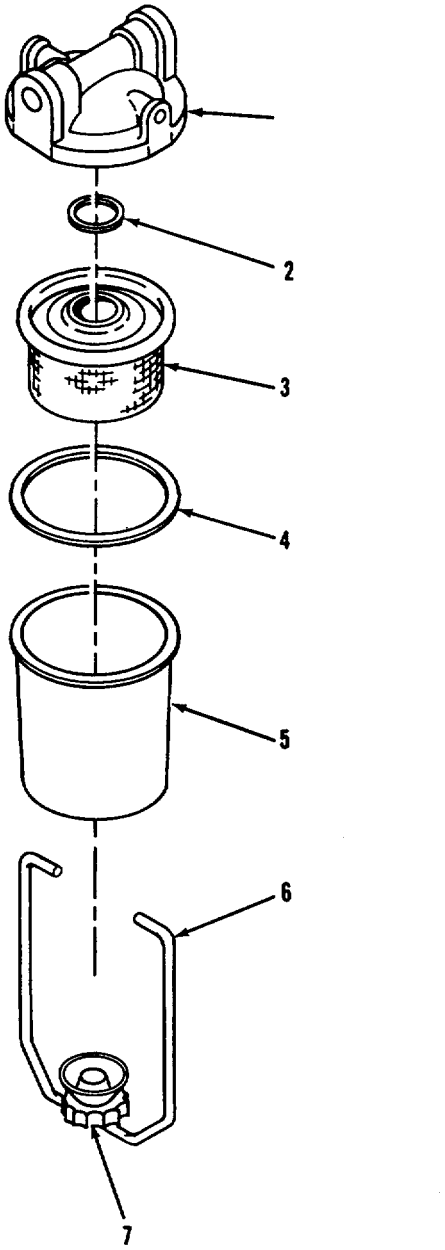
(1) Inspect fuel filter assembly (fig. 4-9) for cracks, breaks, leaks, and secure mounting.

(2) Loosen the nut (7) that secures bowl to filter, swing the bail (6) to one side, and remove the bowl (5), gasket (4), element (3), and gasket (2).

(3) Clean the bowl and element thoroughly

with SD and be sure no sediment or lint remains in the bowl.

(4) Using new gaskets, install bowl. Swing the bail back in place and tighten the nut.



1. Cover
2. Gasket, element
3. Element
4. Gasket, bowl
5. Bowl
6. Bail
7. Nut

Figure 4-9. Fuel filter, exploded view.

b. Removal.

(1) Close fuel shutoff cock (6, fig. 4-7) at fuel filter (5).

(2) Disconnect fuel line (2) at fuel filter.

(3) Remove fuel filter from elbow (3) at fuel tank.

c. Installation. Reverse procedure in *b* above.

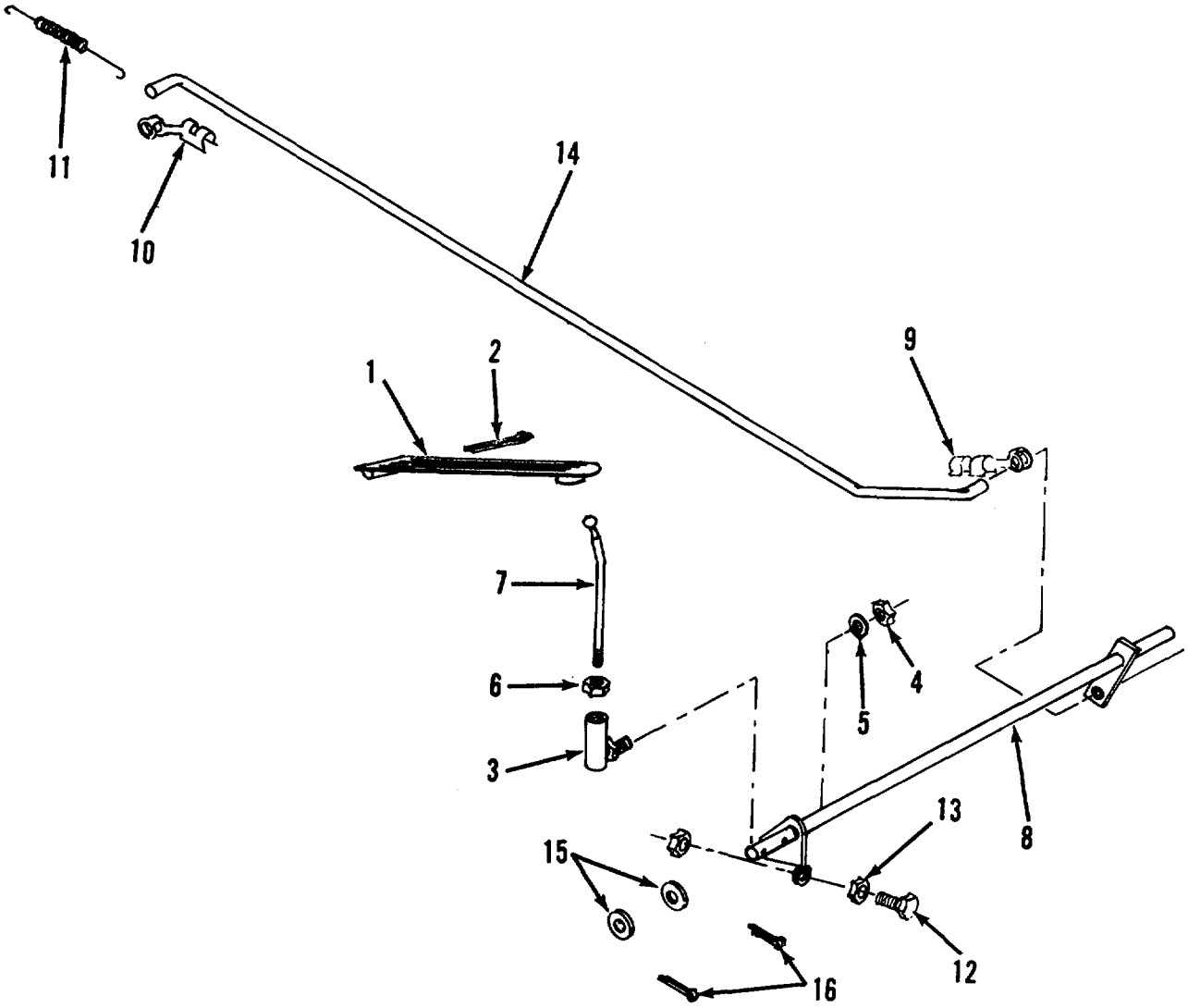
4-28. Accelerator Pedal and Linkage.

a. Removal and Disassembly.

(1) Remove cotter pin (2, fig. 4-10) and pull pedal (1) free of ball on rod (7). Remove floor plate and raise engine cover for access to the rest of the linkage.

(2) Remove return spring (11) and clips (9 and 10). Remove throttle rod (14).

(3) Remove cotter pin (16), washers (15) and take cross shaft (8) from frame. Remove remaining hardware as required.



1. Pedal
2. Cotter pin
3. Ball joint
4. Nut
5. Lock washer
6. Jam nut
7. Rod
8. Cross shaft
9. Clip
10. Clip
11. Return spring
12. Pedal stop screw
13. Jam nut
14. Throttle rod
15. Flat washer
16. Cotter pin

Figure 4-10. Accelerator linkage.

b. Assembly and Installation. Reverse procedure in *a* above.

c. Accelerator Pedal and Linkage Adjustment.

(1) With floor plate removed, hold carburetor throttle valve fully open.

(2) Hold throttle rod (14) forward so pedal stop screw (12) is held against stop.

(3) Adjust pedal stop screw so carburetor end of throttle rod freely enters hole in carburetor throttle lever. Install clip (10), floor plate and pedal.

Section IX. COOLING SYSTEM

4-29. Thermostat and Elbow

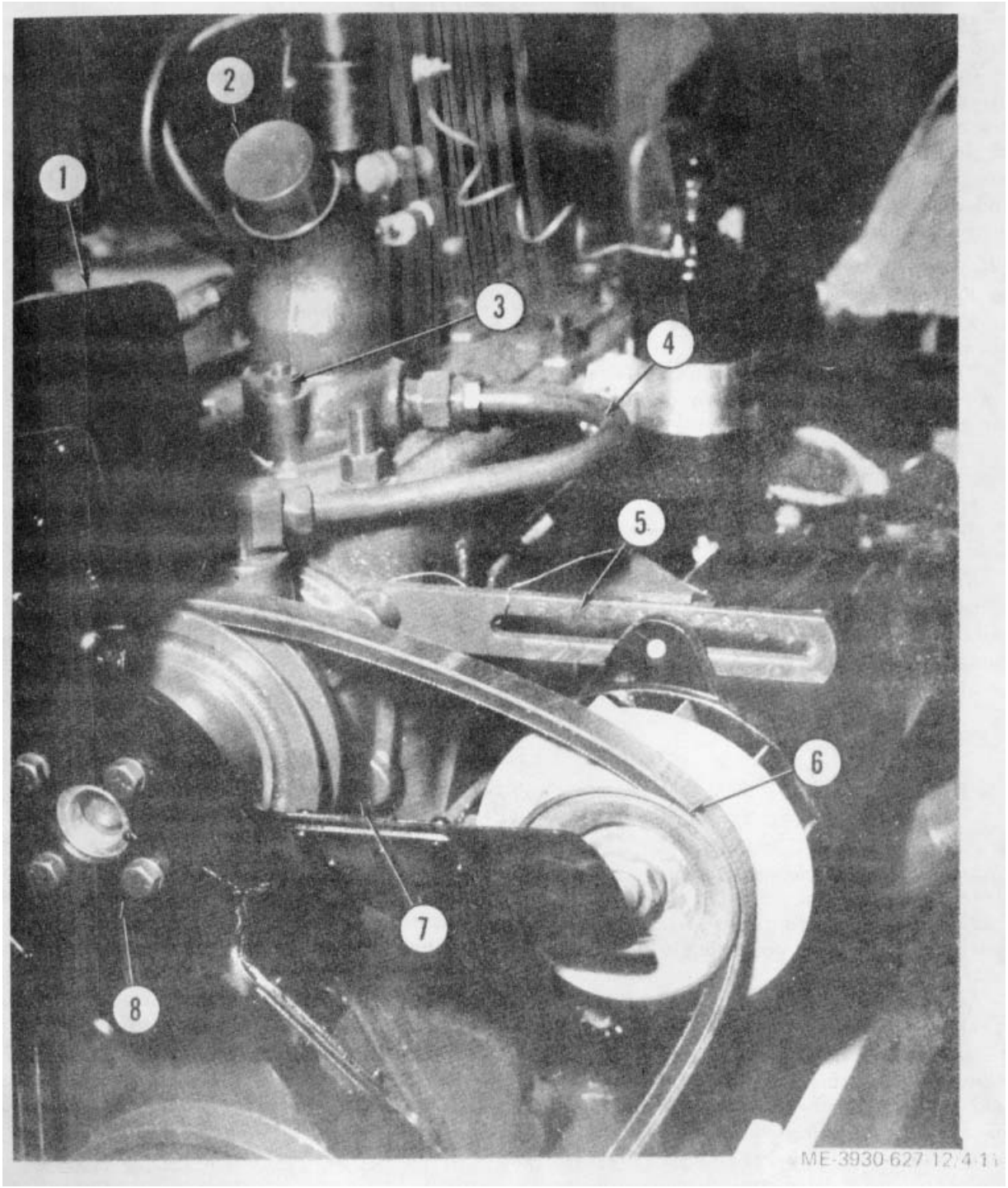
a. Removal.

(1) Drain cooling system.

(2) Loosen hose clamp and remove hose from elbow (2, fig. 4-11).

(3) Remove recirculating tube (4) from truck.

(4) Remove nuts (3) and lock washers that secure elbow to cylinder head and remove elbow with thermostat and adapter. Separate thermostat and adapter from the elbow and remove recirculating tube elbow. Remove the gasket from the cylinder head.



1. Fan
2. Elbow
3. Nut
4. Recirculating tube
5. Adjusting strap
6. Fan belt
7. Water pump
8. Cap screw

Figure 4-11. Engine, front view.

b. Testing.

(1) Suspend thermostat in a container of water so that it does not touch the bottom of the container.

(2) Heat water and check temperature with a thermometer. The thermostat valve should start to open at about 1600F. and should be fully open at 1800F.

(3) If the thermostat opens before the water temperature reaches 1600F. or does not open until after the water temperature reaches 1800F., it should be replaced.

c. Inspection. Inspect adapter for deterioration. Inspect elbow .(housing) for cracks and thread for damage.

d. Installation. Reverse procedure in a above, using a new gasket between the elbow and the cylinder head. Make sure split in adapter aligns with bypass hole in elbow.

4-30. Water Pump, Fan, Belt, and Radiator

a. Removal.

(1) Loosen alternator adjusting strap bolt at water pump.

(2) Loosen alternator mounting bolts securing to mounting support and remove belt from alternator and crankshaft pulleys.

(3) Work fan belt (6, fig. 4-11} over fan (1) and rotate fan until belt can be removed from the fan.

(4) Remove screws (8) and lockwashers that secure fan to hub. Remove fan (1).

(5) Drain radiator.

(6) Disconnect recirculating tube (4) at water pump and at thermostat elbow and remove from engine.

(7) Loosen outlet (lower) radiator hose clamp and separate hose from water pump (7) and from radiator. Disconnect remaining hoses from radiator.

(8) Remove mounting capscrews and lock washers, remove adjusting strap cap screws, and remove water pump (7) and gasket from engine block. (Bottom cap screw has copper washer.)

(9) Remove screws at sides of radiator and remove radiator.

b. Inspection.

(1) Inspect the pump for secure mounting.

(2) Inspect the water pump bearing for noise.

(3) Inspect the fan for secure mounting, bent or cracked blades.

(4) Inspect the fan belt for wear, frays, and proper adjustment of /2 inch finger-pressure deflection at midpoint between the crankshaft pulley and the fan pulley.

c. Installation. Reverse steps of a above, installing a new water pump gasket. Refill cooling system.

d. Adjustment of Belt.

(1) Loosen the alternator adjusting strap bolt and the alternator mounting bolts.

(2) Pivot alternator for desired belt tension *(b* (4) above) and tighten adjusting strap bolt and alternator mounting bolts.

Section X. ELECTRICAL SYSTEM

4-31. Alternator

a. Removal.

(1) Disconnect wiring harness and ground lead at front of alternator.

(2) Remove attaching screw at adjusting strap (fig. 4-11) and screws at mounting bracket, and lift off alternator.

b. Installation.

(1) Position alternator on mounting bracket and install screws attaching alternator to mounting bracket and adjusting strap.

(2) Install drive belt on alternator pulley, and adjust drive belt tension so that drive belt can be deflected one-half inch by finger pressure at midpoint between drive and driven pulleys. To adjust tension, loosen cap screw that holds adjusting strap to alternator and loosen screws that hold alternator to mounting bracket. To tighten, use bar to pry alternator away from engine to achieve correct tension; then tighten adjusting strap cap screw. Tighten mounting screws.

(3) Reconnect wiring harness and ground lead to alternator.

c. Test.

(1) Connect assembled alternator as shown in figure 4-12. Make sure negative terminal is connected to ground. Adjust load rheostat to obtain specified output of 14 volts. Check amperage at 2000 alternator rpm or 1000 engine rpm (cold); it should be 21 amperes. Check amperage at 5000 alternator rpm or 2500 engine rpm (cold); it should be 30 amperes. Operate alternator until it is at operating temperature. Check output amperage; it should be 32 amperes maximum.

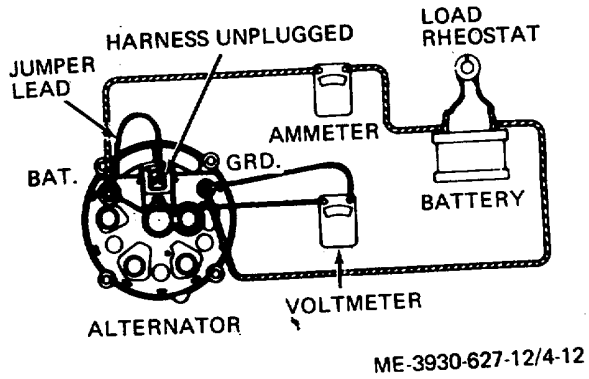


Figure 4-12. Alternator test setup.

(2) If output is not as specified, replace alternator.

Note. Additional tests and repairs are beyond scope of equipment available at organizational maintenance. Refer defective alternators to direct or general support maintenance.

4-32. Alternator Voltage Regulator

a. Test.

(1) Run engine at about 1500 rpm for 15 minutes with spotlight on, and a thermometer placed about 1/4 inch from the regulator cover.

(2) With engine running, connect a voltmeter to ground at the regulator base, and to either number 3 or number 4 terminal of the regulator (fig. 4-13). Compare temperatures and voltage reading with values given below in table 4-3 to learn if regulator is in specified operating range.

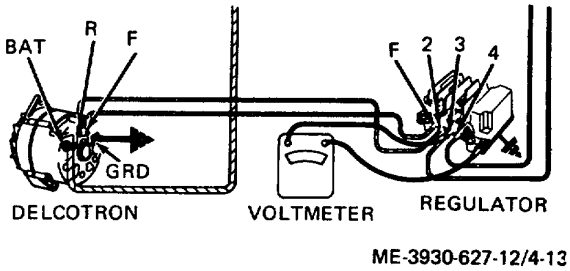


Figure 4-13. Voltage regulator rest setup.

Table 4-3. Regulator Voltage Specifications

A+65 deg. F.	14.1 to 14.8 volts
A+85 deg. F.	13.9 to 14.7 volts
A+105 deg. F.	13.7 to 14.5 volts
A+125 deg. F.	13.6 to 14.3 volts
A+ 145 deg. F.	13.4 to 14.2 volts

(3) If actual voltage is not within the specified range, remove access plug from regulator cover (fig. 4-14) and note the position of the plastic screw slot beneath the plug. The slot will be lined up with one of the divisions or lines cast on the regulator cover. For each division the slot has been moved clockwise from the middle position ("0" position) or toward the "+ " cast on the cover, add 0.3 volt to the above specified range for the proper specified voltage limits. For each division the slot has been moved counterclockwise from the middle ("0" position) or toward the "-" on the cover, subtract 0.3 volt from the above specified range for the proper specified voltage limits. As an example, assume that the slot is lined up with the second line from the "0" nearest the "+" mark. This position would require adding of 0.6 volt to the specification voltage shown in the specification table. The limits at 1250 would become 14.2 to 14.9 volts instead of the 13.6 to 14.3 volts given for the middle or "0" position.

(4) If the actual regulating voltage as checked is not within the voltage range specified for the measured ambient temperature, replace the regulator.

(5) If the actual regulating voltage as checked is within the voltage range specified for the measured ambient temperature, the charging system operation is satisfactory. However, the voltage setting of the regulator may need to be changed to meet the battery charging requirements for the type of driving being done. To properly adjust the voltage setting, refer to *b* below.

b. Voltage Adjustment. To adjust the voltage regulator setting, remove the access plug from the regulator (fig. 4-14). Then to correct for an undercharged battery insert screwdriver into slot and turn clockwise one notch (0.3 volt) to increase the setting. To correct for an overcharged battery, turn counterclockwise one notch (0.3 volt) to decrease setting. Then check for an improved battery condition over a service period of reasonable length. If necessary, repeat the above procedure for a higher or lower setting.

Note. Additional tests and adjustments of the regulator are beyond the scope of equipment normally available at organizational maintenance. If troubles are not corrected, refer to direct or general support maintenance.

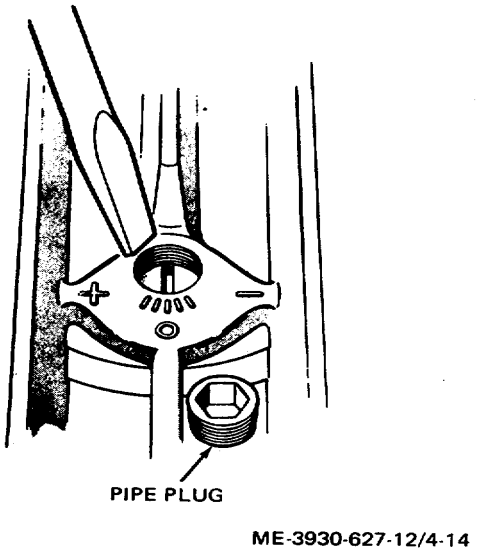


Figure 4-14. Regulator adjustment screw.

c. Replacement. Unplug wiring harness from regulator, and remove mounting screws from base

to remove regulator. Reverse this procedure to install the regulator.

4-33. Battery

Caution: Note that alternator and regulator circuits have negative ground. Take special care that following procedures are used. Failure to follow these procedures will result in burned out diodes and / or alternator windings.

1. When installing battery, always make absolutely sure negative terminal of battery is grounded.

2. When connecting booster battery, make certain to connect negative battery terminals together and positive battery terminals together.

3. When connecting charger to battery, connect charger positive lead to positive battery terminal and charger negative lead to negative battery terminal.

a. Removal.

(1) Loosen nuts which clamp cable terminal to battery posts and remove cables from posts. Do not remove caution tag from negative cable terminal.

(2) Remove nuts securing battery holddown angle, remove holddown angle and hook bolts. Carefully lift out battery.

Caution: If battery top is wet, there is probably electrolyte present which is corrosive to metals and destructive to clothing. Avoid contact and rinse battery freely with clear water.

b. Installation. Since charging system components of this truck could be damaged if the battery is connected in reverse polarity, be careful to identify the battery posts before reconnecting cables. The ground cable is to be connected to the negative post.

(1) Install holddown angle and hook bolts, and tighten nuts on hook bolts only snug enough to hold battery in place. Do not draw them tight enough to exert significant pressure on the battery case.

(2) Connect battery cables to posts.

(3) Coat posts and cable clamp terminals, after installation, with petroleum jelly or GAA to prevent corrosion.

c. Specific Gravity Test. Specific gravity testing of the battery electrolyte determines the state of charge in each battery cell. Use a hydrometer and thermometer, correcting the hydrometer reading for temperature. A corrected specific gravity reading of 1.260 to 1.280 in each cell indicates a fully charged battery. A specific gravity reading of 1.220 or less in each cell indicates that the battery must be recharged or replaced.

Note. A temperature corrected specific gravity measurement is obtained by adding 0.004 to the actual hydrometer reading for each 10 degrees F the electrolyte is above 80 degrees F, or subtracting 0.004 from the actual hydrometer reading for each 10 degrees F the electrolyte is below 80 degrees F.

d. Cleaning. The top of the battery must be kept clean. Tighten vent plugs and clean battery with a brush dipped in a solution of baking soda and water, followed by a thorough rinse with clear water. If terminals and cable clamps are corroded, disconnect cables and clean in same manner as battery.

4-34. Starter

a. Removal.

(1) Disconnect one cable at the battery to prevent shorting of tools against truck frame.

(2) Disconnect and tag all electrical leads at the starter solenoid.

(3) Remove starter motor mounting screws and washers, and take starter motor from flywheel housing.

b. Installation.

(1) Position starter motor at mounting pad on flywheel housing.

(2) Install mounting bolts and washers and tighten.

(3) Reconnect leads to starter solenoid.

(4) Reconnect battery cable at battery.

4-35. Distributor

a. Inspection.

(1) Inspect the distributor cap (2, fig. 4-15) for cracks, carbon streaks, corroded terminals, and dirt.

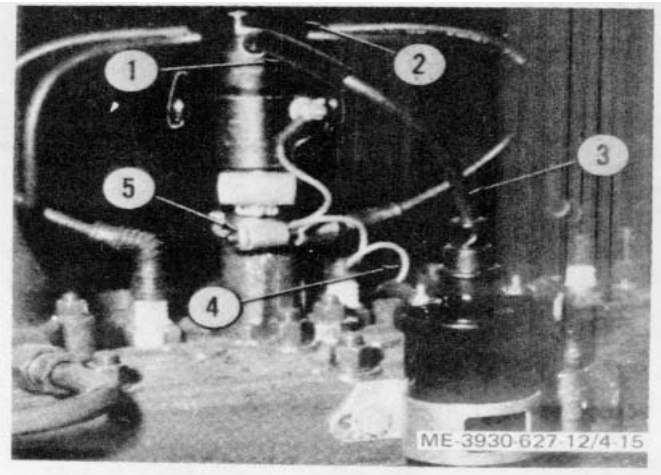
(2) Be certain the distributor is mounted securely.

(3) Inspect the contact points (6, fig. 4-16). Be sure they are free of burns, pits, or frosting; are aligned correctly; and are adjusted properly to 0.022 inch. Follow adjustment procedure in *g* below.

(4) Inspect the rotor (1) for cracks and the metal contact strip for burned condition.

(5) Inspect electrodes for burns. Inspect cable ports for dirt and corrosion.

(6) Inspect condenser for secure mounting and frayed lead.



1. Suppressor
2. Distributor cap
3. Secondary lead
4. Primary lead
5. Clamp

Figure 4-15. Distributor, installed.

b. Removal.

(1) Disconnect primary lead (4, fig. 4-15) at coil and remove secondary lead (3) with suppressor (1) from the distributor cap (2).

(2) Remove spark plug cables from distributor cap, noting position of No. 1 cable for installation.

(3) Remove the cap and mark the position of the rotor in the distributor to facilitate installation. Mark the position of the distributor on the engine block for timing mark on installation of assembly. The firing order is 1-3-4-2 in counterclockwise direction looking from the top of the distributor.

(4) Loosen clamp (5) that secures distributor to the engine cylinder head.

(5) Remove distributor assembly from the engine cylinder head.

(6) If necessary, remove the distributor drive shaft from the engine block. Cover the hole in the engine cylinder head to prevent foreign matter from entering the block.

c. Disassembly.

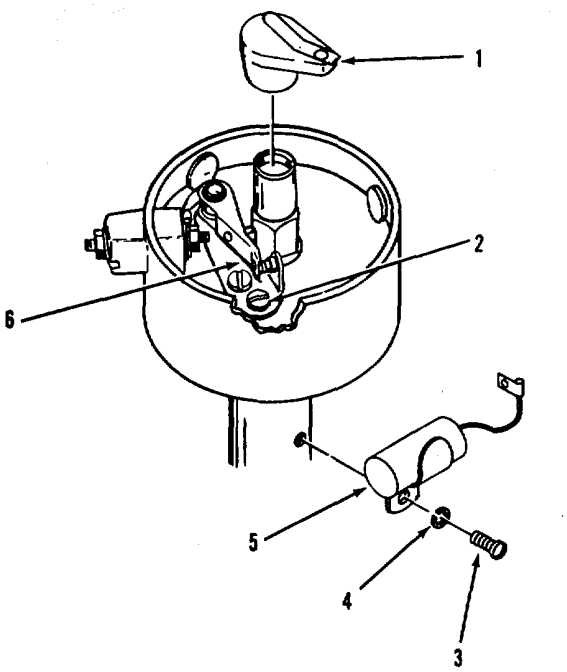
(1) Remove rotor (1, fig. 4-16) from the shaft.

(2) Remove contact set mounting screw (2) and remove contact set (6).

(3) Remove condenser mounting screw (3), lock washer (4), and condenser (5) from the distributor.

(4) Remove distributor primary lead and grommet through the inside of the distributor.

d. Assembly. Reverse procedure in c above and adjust points (*g* below).



1. Rotor
2. Screw
3. Screw
4. Lock washer
5. Condenser
6. Contact set

Figure 4-16. Distributor, partly exploded view.

e. Installation. Reverse procedure in *b* above and use timing light or static method to determine proper timing (f below).

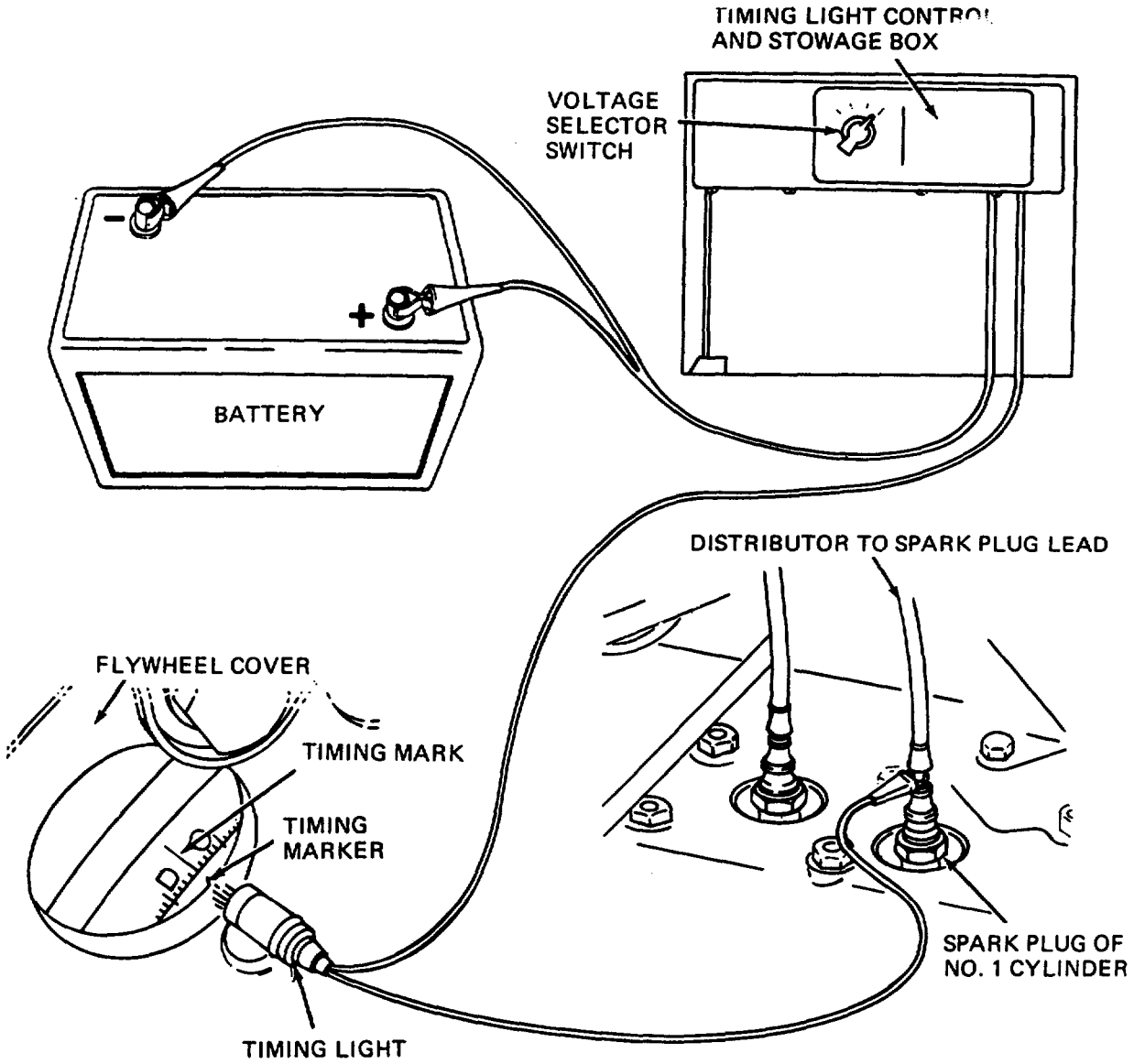
f. Ignition Timing.

(1) *Static method.* Chalk the timing mark on the flywheel so the mark can be seen clearly. Remove No. 1 spark plug and place thumb over spark plug hole. Crank engine until air escapes around thumb. Continue cranking to align the top- dead-center timing mark with pointer. Loosen distributor clamp (5, fig. 4-15) and turn the distributor clockwise on its mounting until the contact points just begin to open. Tighten clamp to secure adjustment. Replace secondary lead.

(2) *Timing light method.* Attach a timing light lead to No. 1 spark plug. Connect the other timing light lead as shown in figure 4-17. Connect tachometer and run engine at 500 rpm. The No. 1 plug should fire at top-dead-center. The light should flash each time the top-dead-center mark on the flywheel passes the pointer on flywheel cover. If adjustment is necessary, loosen the clamp nut and turn the distributor at its mounting. Rotate the

distributor clockwise to advance timing; rotate it counterclockwise to retard timing. Tighten the clamp nuts to secure adjustment.

Note. Figure 4-17 shows one type timing light. Any available timing light may be used.



1. CONNECT TEST EQUIPMENT AS ILLUSTRATED
2. PLACE VOLTAGE SELECTOR SWITCH IN 12 VOLT POSITION
3. START ENGINE AND ADJUST SPEED TO 500 RPM
4. AIM TIMING LIGHT AT TIMING MARKER ON FLYWHEEL COVER. TIMING MARK ON FLYWHEEL SHOULD ALIGN WITH MARKER
5. ACCELERATE ENGINE TO APPROXIMATELY 1, 500 R P M TIMING MARK SHOULD MOVE AHEAD OF TIMING MARKER INDICATING THAT SPARK ADVANCE IS OPERATING PROPERLY

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Figure 4-17. Using ignition timing light.

g. Contact Point Adjustment. With the distributor cap, rotor, and plate removed, and the rubbing block of movable contact at the high point of the cam, check the contact point gap by inserting a 0.022 inch feeler gage between the contact points. If an adjustment is necessary, loosen the mounting screw and insert screwdriver blade in breaker plate opening to move the stationary point contact support until the proper gap is attained. After adjustment is completed, tighten the mounting screw. Also, check points for alignment and bend stationary point if necessary.

4-36. Spark Plugs

a. Removal.

(1) Remove cables from spark plugs.

(2) Clean dirt and other foreign matter from spark plug wells and unscrew and remove spark plugs and gaskets.

b. Cleaning.

(1) Before removal from engine, spark plugs may be cleaned by wiping with a dry rag.

(2) After removal (a above), the spark plugs may be cleaned by sandblasting.

c. Adjusting Gap. Adjust the spark plug gap to 0.025 inch, using a round (wire) spark plug gage. To obtain proper adjustment, bend the ground electrode only.

d. Inspection.

(1) Inspect the shell for breaks and stripped threads.

(2) After removal (a above), check the spark plug insulation for breaks, cracks, or chips.

(3) Check for abnormal carbon deposits and burned electrodes.

e. Tests. Spark plugs may be tested on a spark plug tester, using a good spark plug as standard.

f. Installation. Reverse procedures in a above. Use new gaskets and tighten to 25 to 30 foot-pounds of torque.

4-37. Ignition Coil

a. Replacement.

(1) Disconnect primary leads and suppressor capacitor lead at coil terminals. Pull secondary lead from center of coil, leaving it connected to the distributor cap.

(2) Remove two attaching cap screws and take coil from cylinder head.

(3) Reverse steps (1) and (2) above to install coil.

b. Test. Test coil using portable or bench type coil tester according to instructions given by the maker of the tester. There is no repair of a defective coil.

Section XI. TRANSMISSION

4-38. Transmission and Torque Converter Maintenance

Organizational maintenance of the transmission is limited to the requirements of LO 10-3930-627-12.

Section XII. HANDBRAKES

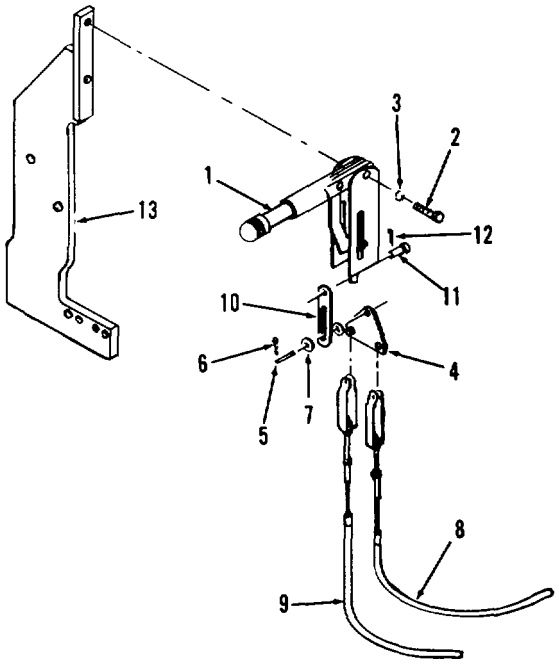
4-39. Hand Brake

a. Adjustment.

(1) Hand brake must be able to hold truck in place when loaded to rated capacity and stopped on a 15 degree incline.

(2) Under conditions given above, apply hand brake and release foot brake. If truck moves, release hand brake, turn knurled knob at top of lever (1, fig. 4-18) to tighten adjustment and repeat test.

(3) If the brake needs more adjustment than the knob provides, shorten the effective length of the cables (8 and 9) by adjusting the position of the nuts at the top end of the cables. Be sure both cables apply equal pressure to brakes.



1. Hand brake lever
2. Cap screw
3. Lock washer
4. Equalizer plate
5. Pin
6. Cotter pin
7. Flat washers
8. Cable assembly
9. Cable assembly
10. Link
11. Pin
12. Cotter pin
13. Mounting bracket

Figure 4-18. Hand brake lever and cable replacement.

b. Lever and Cable Replacement.

(1) Remove cap screws (2) and lock washers (3) to free lever assembly from bracket (13) on truck frame.

(2) Remove pins holding cables (8 and 9) to equalizer plate (4) and take lever from truck. To remove cables disconnect them at the axle and lever (13, fig. 4-23) and take them from the truck. Reverse this procedure to install cables. Refer to figure 4-18 to salvage any usable parts of the assembly.

(3) Install lever by reversing steps (1) and (2) above.

4-40. Master Cylinder Replacement

a. Remove truck floor plate.

b. Disconnect tube (1, fig. 4-19) from tube fitting (2).

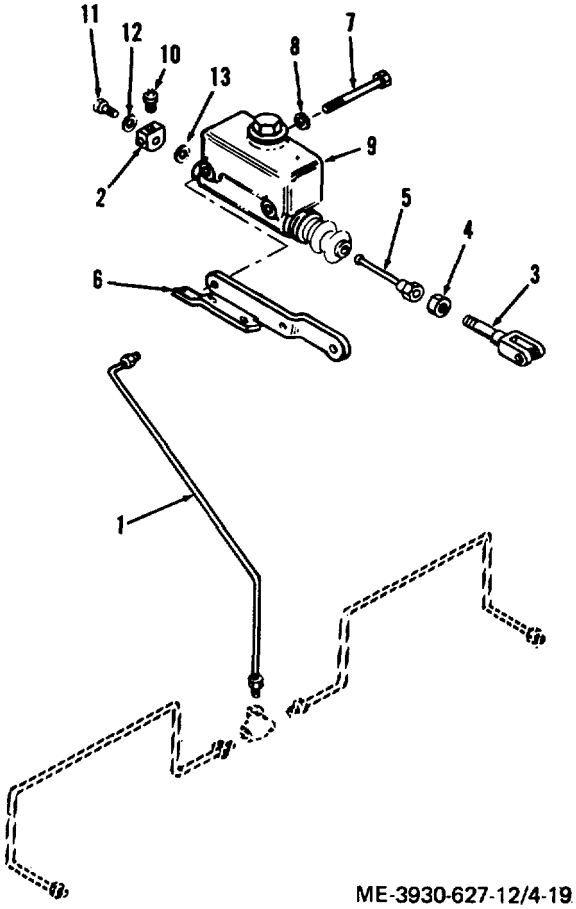
c. Disconnect stop light wires at stop light switch (10).

d. Loosen jam nut (4) and unscrew push rod (5) from clevis (3).

e. Remove screws (7) and washers (8) and take master cylinder (9) from bracket (6).

f. Remove switch (10), connector bolt (11) and washers (12 and 13) for reuse, as they may not be included with a rebuilt master cylinder.

g. Install by reversing steps a to *e* above. Fill reservoir with specified fluid and bleed brakes



1. Brake tube
2. Tube fitting
3. Clevis
4. Jam nut
5. Push rod
6. Mounting bracket
7. Screw
8. Washer
9. Master cylinder
10. Switch
11. Connector bolt
12. Washer
13. Washer

Figure 4-19. Brake master cylinder replacement.

4-41. Brake Shoes and Wheel Cylinders

a. Removal.

(1) Block up front end enough so front wheels are off ground.

(2) Drain oil from transmission and drive, axle.

(3) Remove drive wheels.

(4) Disconnect tube assemblies (44 and 47, fig. 4-20).

(5) Disconnect cables at parking brake lever (13).

(6) Remove final drive case (5) secured with screws (32) and washers (30). Remove final drive shaft (28) and drum (26) secured with nut (11), cotter pin (12), and washer (10).

(7) Remove brake drum seal (25) from brake assembly (20). Remove parking brake rod (18) and spring pin (19).

(8) Remove brake assembly (20) secured with screws (24), nuts (221, and washers (21 and 23).

(9) Remove shoe retaining spring (1, fig. 4-21) . Remove shoe return spring (2) and brake actuating lever (3).

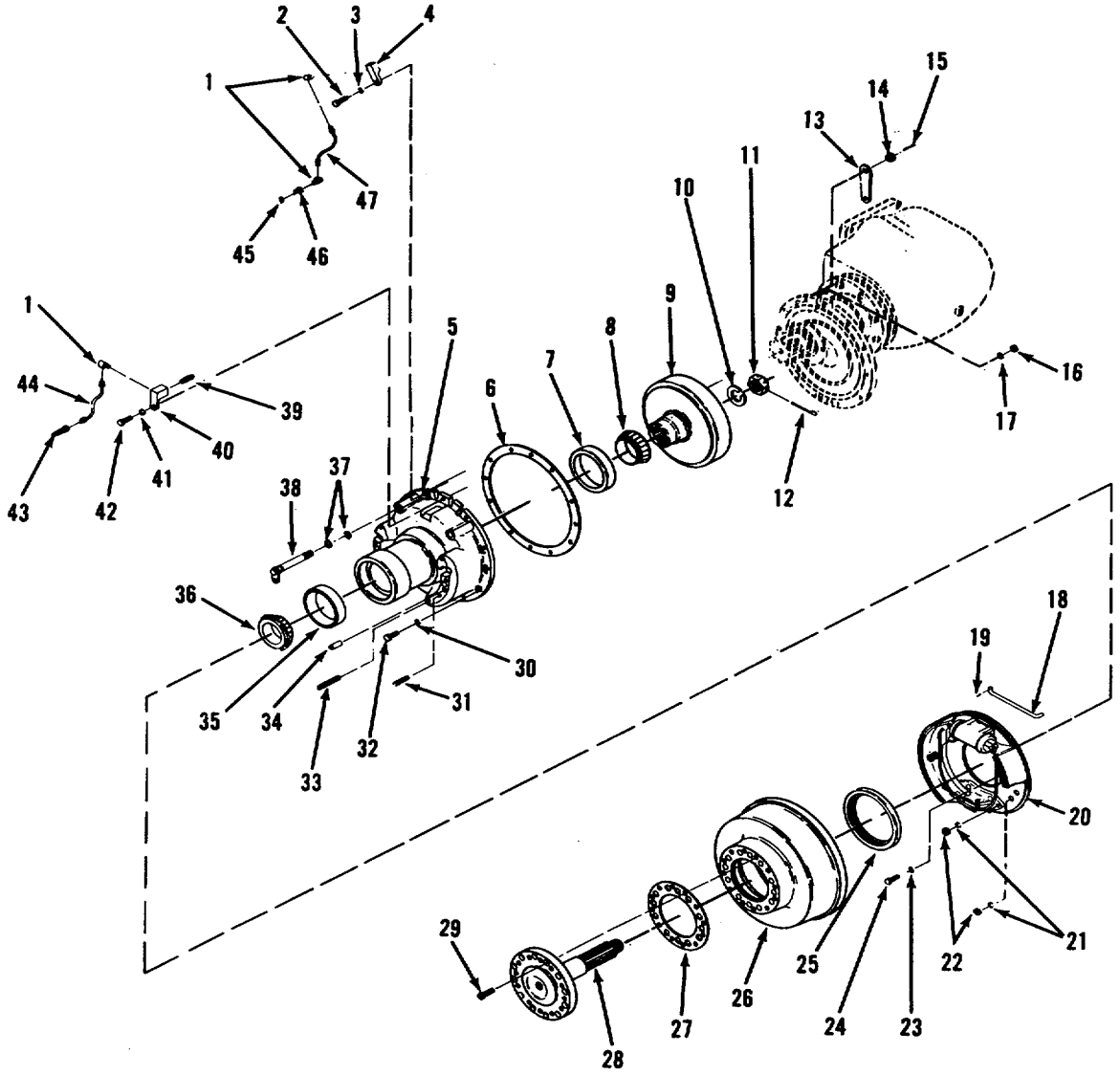
(10) Install wheel cylinder clamp to retain components of wheel cylinder.

(11) Remove wheel cylinder body (5) and components and gasket (6) attached with screws (9) and washers (8).

(12) Remove seal (11) from backing plate (7).

(13) Remove brake shoes (4) attached with rods (10), retainers (17), and springs (18).

(14) Remove wheel cylinder clamp from wheel cylinder and remove links (16), boots (15), pistons (14), cups (13), and spring (12).



1. Elbow
2. Screw
3. Washer
4. Brake fitting
5. Final drive case
6. Gasket
7. Inner bearing cup
8. Inner cone and roller bearing
9. Internal gear
10. Washer
11. Nut
12. Cotter pin
13. Parking brake lever
14. Nut
15. Cotter pin
16. Nut
17. Washer
18. Parking brake rod
19. Spring pin
20. Brake assembly
21. Washer
22. Nut
23. Washer
24. Screw
25. Brake drum seal
26. Brake drum
27. Gasket
28. Final drive shaft
29. Screw
30. Washer
31. Stud
32. Screw
33. Stud
34. Pin
35. Outer bearing cup
36. Outer cone and roller bearing
37. Pre-formed packing
38. Brake lever assembly
39. Bleeder screw
40. Brake fitting
41. Washer
42. Screw
43. Adapter
44. Tube assembly
45. Gasket
46. Adapter
47. Tube assembly

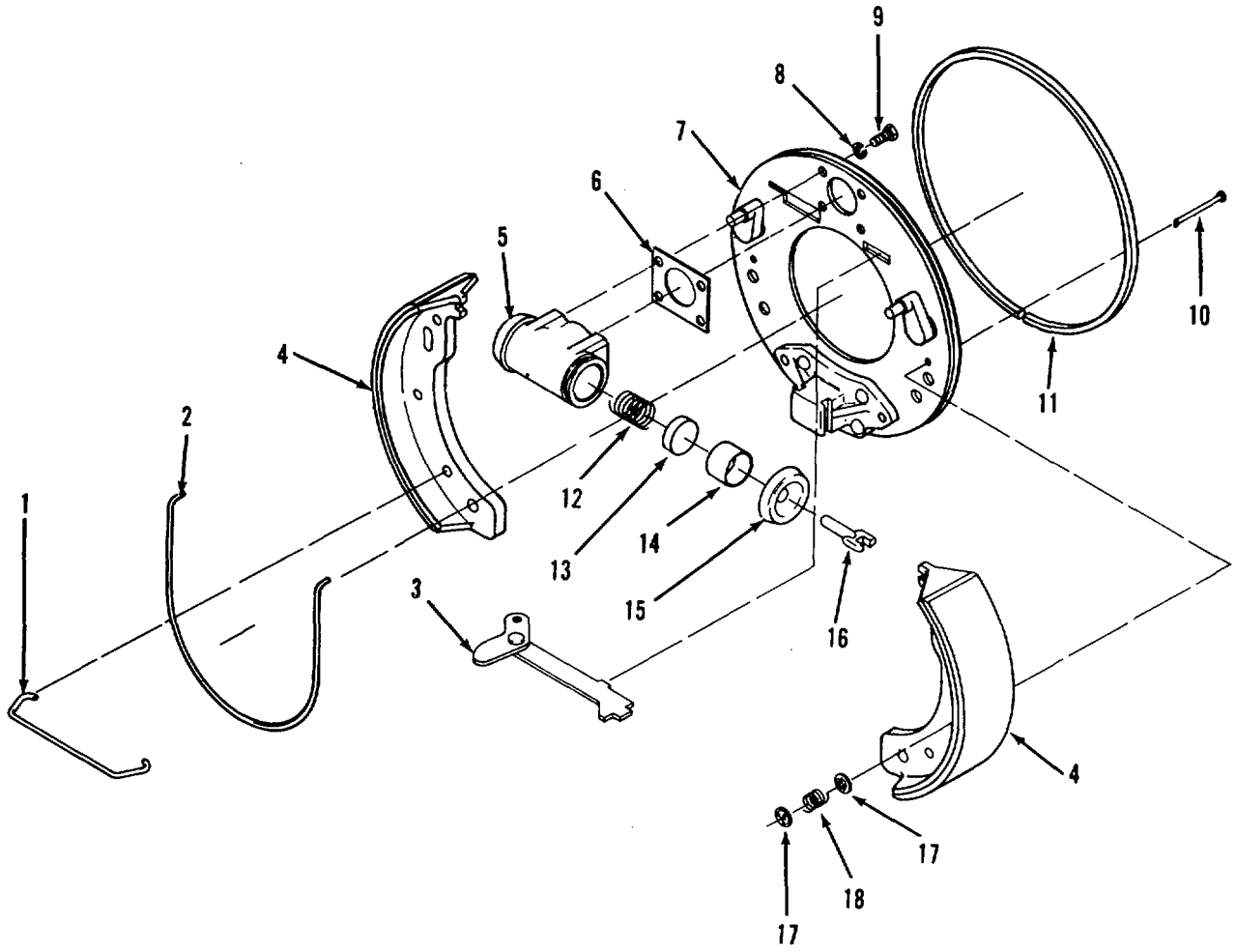
Figure 4-20. Axle end and wheel brake removal.

b. Installation.

(1} Reverse procedure in a above. Move shoe adjuster on backing plate (7) toward center of backing plate before attempting to install brake drum.

(2) Bleed brakes.

c. Wheel Brake Adjustment. Application of the foot pedal sets the automatic adjustment. No further adjustment of the wheel brake is required.



1. Shoe retaining spring
2. Shoe return spring
3. Brake actuating lever
4. Brake shoe
5. Wheel cylinder body
6. Gasket
7. Backing plate with self-adjusters
8. Washer
9. Screw
10. Rod
11. Seal
12. Spring
13. Cup
14. Piston
15. Boot
16. Link
17. Retainer
18. Spring

Figure 4-21. Service brake.

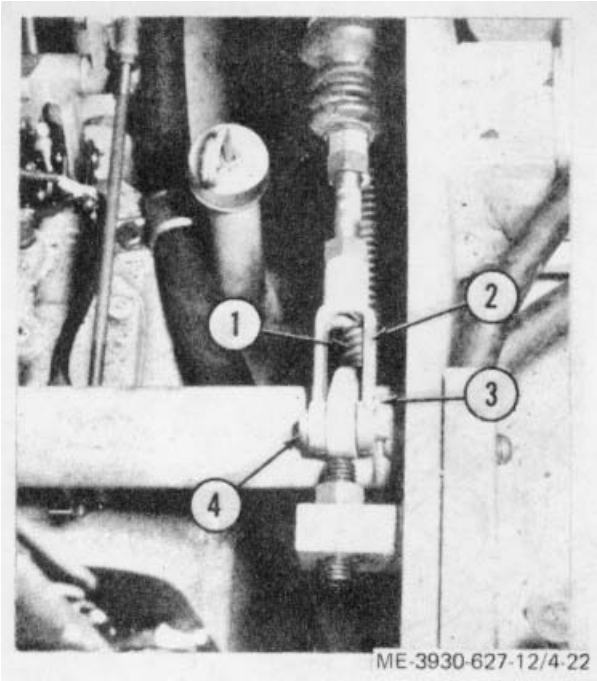


Figure 4-22. Brake and inching pedal adjustment.

d. Brake Pedal Free Travel Adjustment.

(1} Remove floor plate.

(2) Remove pedal return spring (1) to more easily feel the range of free travel.

(3) Adjust push rod (5, fig. 4-19), turn bellcrank clevis (2) in or out to obtain free travel of 3/8 to %5 inch at pedal pads.

(4) Install pedal return spring, and floor plate.

Section XIII. WHEELS

4-42. General

This section contains instructions for the maintenance operations which organizational maintenance personnel are authorized to perform on the driving (front) wheels, the steering (rear) wheels, and the tires.

4-43. Steering Wheels and Bearings

a. Removal.

(1) Jack the steering wheels off the floor and block the truck securely.

(2) Remove the hub cap 112, fig. 4-23).

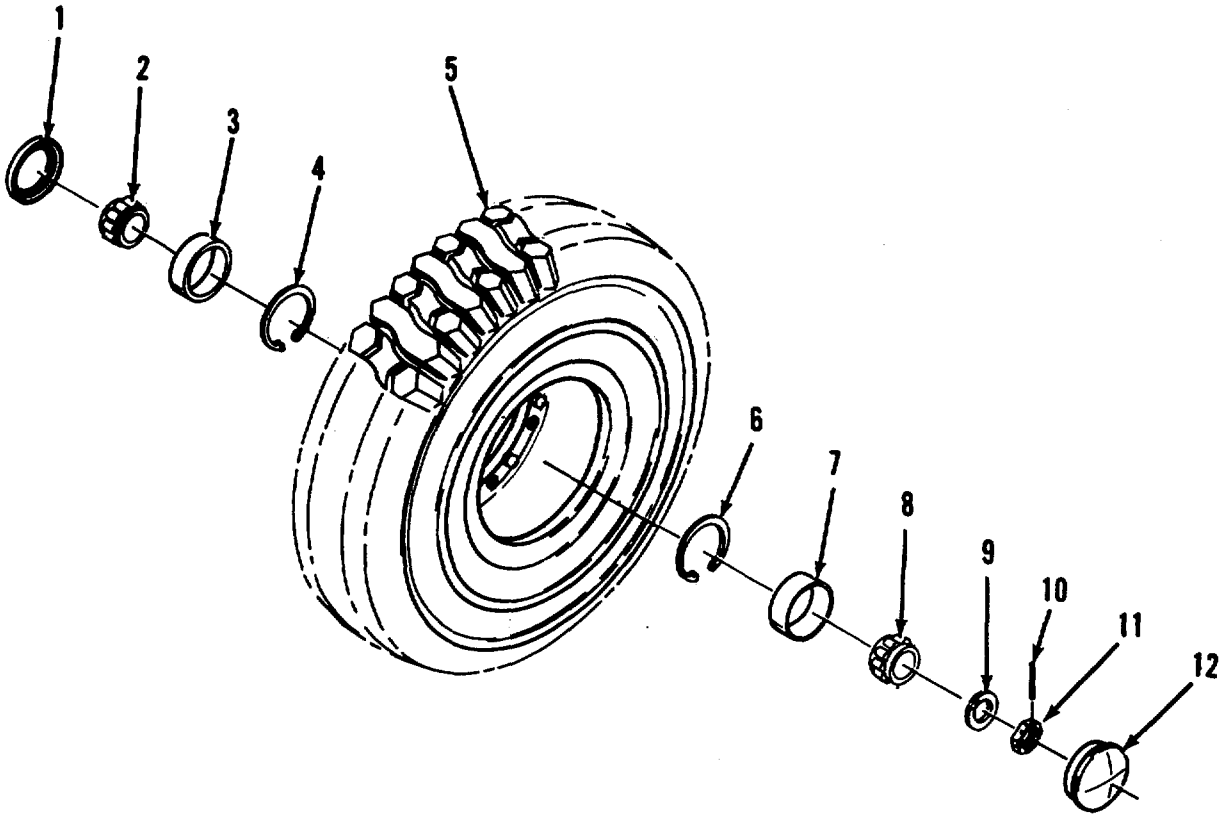
(3) Remove the cotter pin (10) that locks the adjusting nut (11) to the spindle.

(4) Remove the adjusting nut, flat washer (9), and bearing cone (8).

(5) Remove the wheel (5) from the spindle.

(6) Remove the bearing cone (2) and oil seal (1) from the spindle.

(7) Remove the bearing cups (3 and 7) and the snap rings (4 and. 61 from the hub.



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1. Oil seal
2. Bearing inner cone
3. Bearing cup
4. Snap ring
5. Wheel and tire
6. Snap ring
7. Bearing cup
8. Bearing outer cone
9. Flat washer
10. Cotter pin
11. Adjusting nut
12. Hub cap

Figure 4-23. Steering wheel and bearings, exploded view.

b. Cleaning and Inspection.

(1) Clean the cups, cones, nuts, washers, and hubcaps with SD, and dry them with clean soft cloth.

(2) Inspect the cups, cones, and washers for breaks, cracks, burrs, scoring, and wear. Repack bearings.

(3) Replace all seals with new ones.

c. Installation. Reverse procedures in *a* above and adjust wheel bearings.

d. Adjustment.

(1) Raise rear wheels off ground and block securely.

(2) Remove hubcap.

(3) Remove the cotter pin from the adjusting nut (11, fig. 4-26).

(4) Tighten the nut until a slight drag is felt when the wheels are turned.

(5) Back off the nut not more than one-sixth of a turn to the nearest cotter pin hole, then insert the cotter pin.

(6) Install hubcap and remove blocks and jack.

4-44. Steering Wheel Tires and Tubes

a. Removal.

(1) Jack the steering wheels off the floor and block the truck securely.

(2) Remove mounting nuts and lock washers.

(3) Pull rim and tire from axle.

(4) Deflate tire, remove six nuts and washers holding rim disks together and remove disks from tire.

(5) Remove tube from tire.

b. Repair. Patch tube or replace as required.

c. Installation. Reverse procedure in a above. Inflate tires to 100 psi.

4-45. Drive Wheels and Bearings

a. Removal.

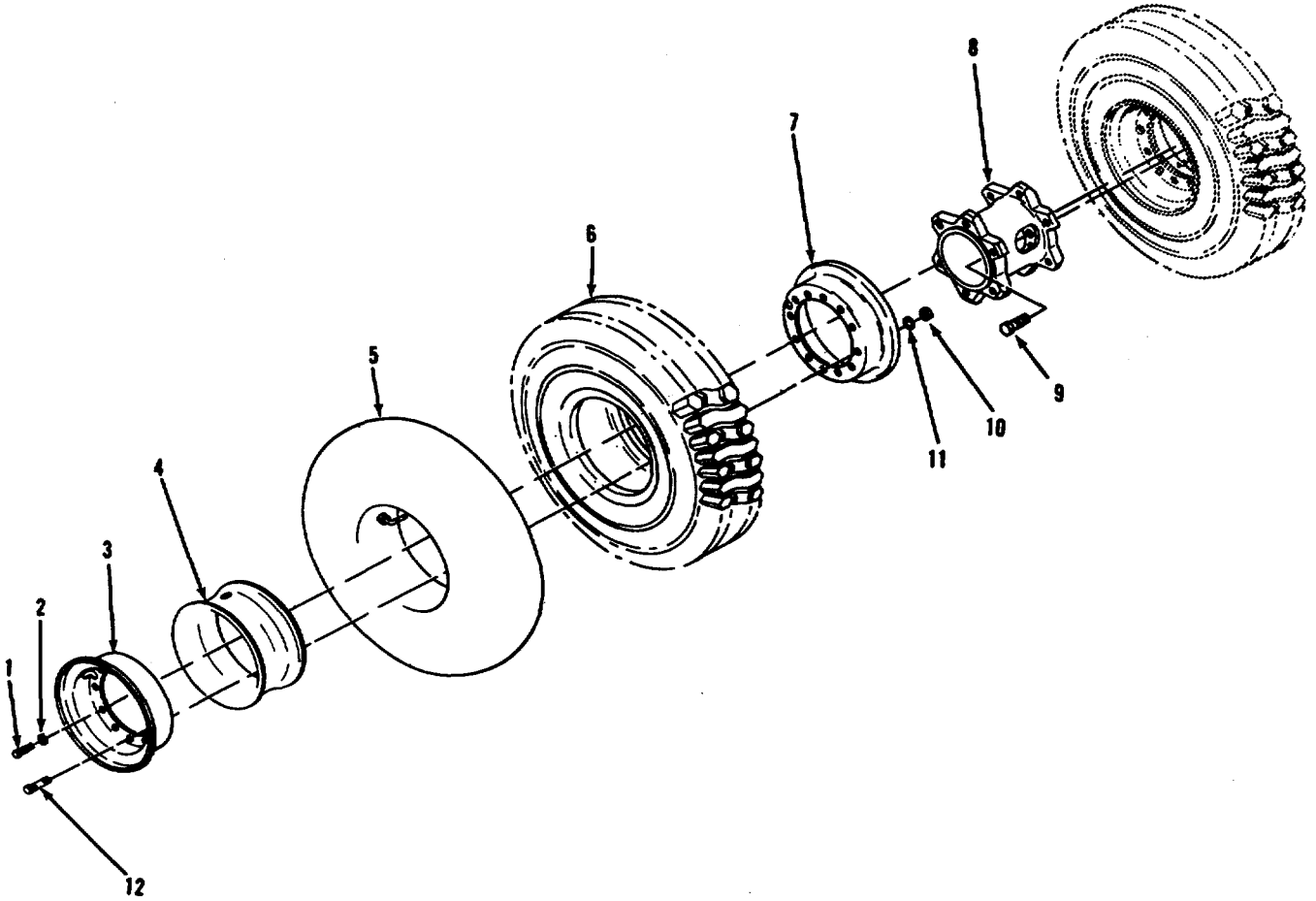
(1) Tilt top of mast rearward.

(2) Place blocks under outer rail and tilt mast forward to raise drive wheels from floor and block the truck securely.

(3) Through center of wheel adapter (8, fig. 4-24), remove 12 screws (9) holding dual wheel and tire assembly to axle.

(4) Remove dual wheel and tire assembly from truck.

(5) Perform disassembly (para 4-43) to remove bearings, hubs, drums and seals.



1. Screw
2. Washer
3. Rim disk
4. Tire flap
5. Inner tube
6. Tire
7. Rim disk
8. Adapter
9. Screw
10. Nut
11. Washer
12. Screw

Figure 4-24. Drive wheels.

b. Cleaning and Inspection.

(1) Clean the cups and cones with SD and dry them with a clean soft cloth.

(2) Inspect the cups and cones for breaks, cracks, burrs, scoring, and wear.

c. Installation. Reverse procedure in *a* above.

4-46. Drive Wheel Tires and Tubes

a. Removal.

(1) Remove drive wheels.

(2) Remove six screws (1, fig. 4-24) and washers (2) holding each wheel to adapter (8).

(3) Deflate tire, remove six nuts (10) and

washers (11) holding rim disks (3 and 7) together, and remove disks (3 and 7) from tires.

(4) Remove tire flap (4) and inner tube (5) from tire (6).

b. Repair. Patch tube or replace as required.

c. Installation. Reverse procedure in a above. Inflate tires to 100 psi.

Section XIV. STEERING

4-47. Drag Link

a. Removal

(1) Remove drag link end (1, fig. 4-25) from steering axle end.

(2) Remove drag link end 14) from steering arm (5).

b. Installation. With rear wheels pointed straight ahead, and steering wheel in center (straight ahead) position, reverse procedure in a above.

c. Adjustment. With clamps (2) loose, twist drag link as necessary to adjust steering wheel center spoke vertically downward with rear wheels still in straight ahead position.

4-48. Tie Rods

a. Removal.

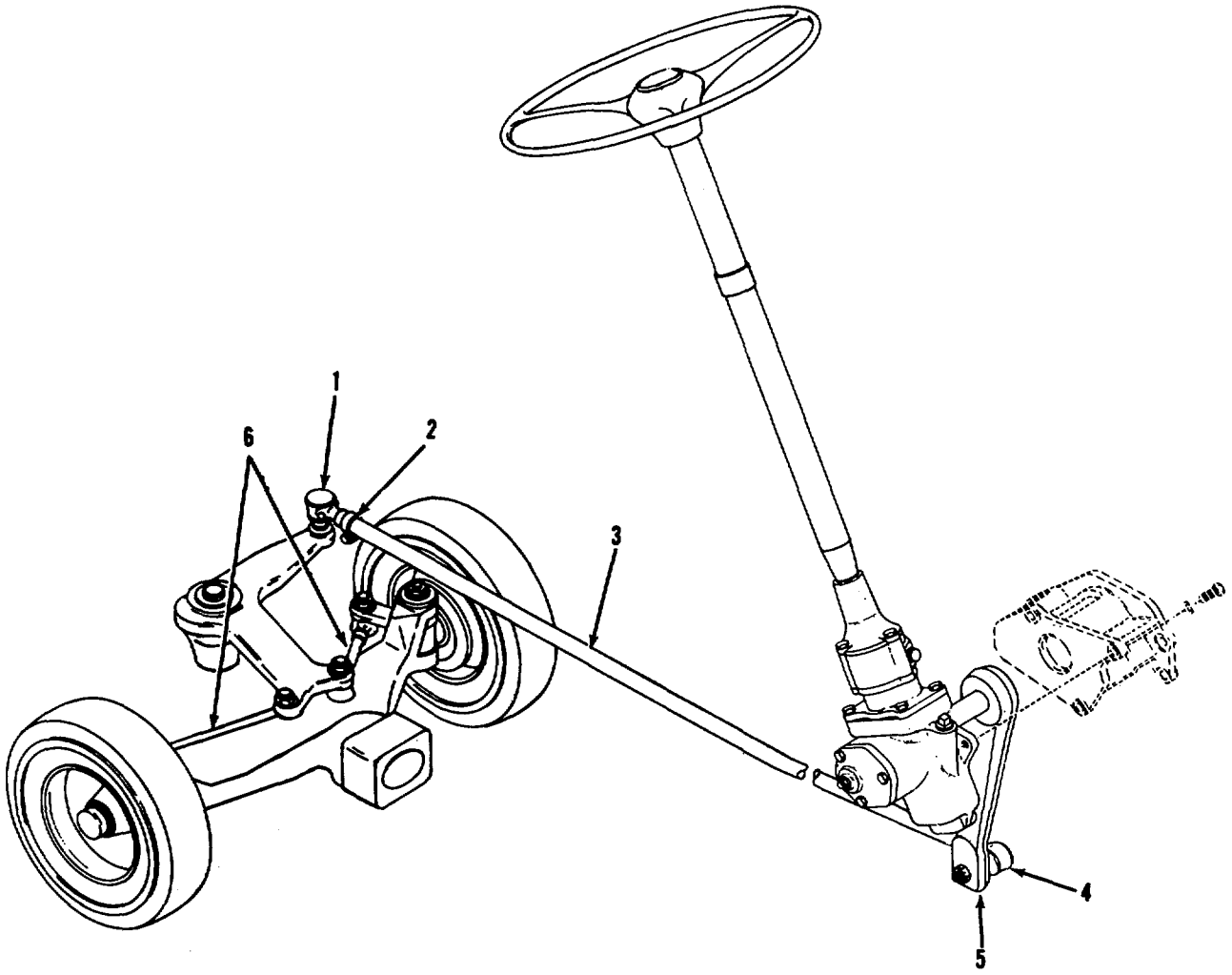
(1) Block up vehicle to a suitable working height.

(2) Remove cotter pins and castellated nuts from tie rod end at ends of tie rods (6. fig. 4-25).

(3) Remove the tie rod assembles from the truck.

b. Installation. Reverse procedure in a above.

c. Adjustment. Loosen tie rod end clamps. Twist each tie rod until distance between rear tires at hub height is 323/4 inches front and rear.



1. Drag link end
2. Clamp
3. Drag link
4. Drag link end
5. Steering arm
6. Tie rods

Figure 4-25. Steering arrangement.

4-49. Steering Gear

The steering gear is lubricated by fluid from the truck hydraulic system. No service is required.

Section XV. HYDRAULIC LIFT COMPONENTS

4-50. Control Valve Maintenance

a. Removal (fig. 4-29).

(1) Tag hoses to identify them for reconnection and disconnect them at the valve. Strip valve of fittings and cap or plug hoses to keep dirt out. Save any usable fittings.

(2) Remove screws, nuts, and washers attaching the valve to the mounting bracket and take off the valve.

b. Installation and Adjustment.

(1) Adjustment procedures given here presume the valve is installed on a serviceable truck. If

dismounted valve is to be adjusted for return to stock, use same procedure, getting hydraulic pressure from a hydraulic test set, and plug ports before storing valve. Proceed as follows:

(2) Install control valve by reversing step a above.

(3) Reinstall hoses according to tags attached at removal, in valve ports from which they came. Install packing and elbows, then screw adapters into elbows.

(4) Reconnect return hose to adapter and tighten hose clamp.

(5) Install shaft through HOIST and TILT levers, spacing levers with spacers within bracket.

(6) When levers are positioned satisfactorily, install three cotter pins to secure shaft.

(7) Disconnect upper TILT hose, and insert a hydraulic pressure gage scaled to read to 2000 pounds per square inch in TILT hose port.

(8) Remove cap nut at top right side of the control valve and insert a screwdriver in slot of adjusting setscrew. With engine running move TILT control lever to UP position, and turn adjusting setscrew as necessary to cause pressure gage to indicate 1700 to 1900 pounds per square inch. Lock adjustment with nut and recheck setting after tightening nut.

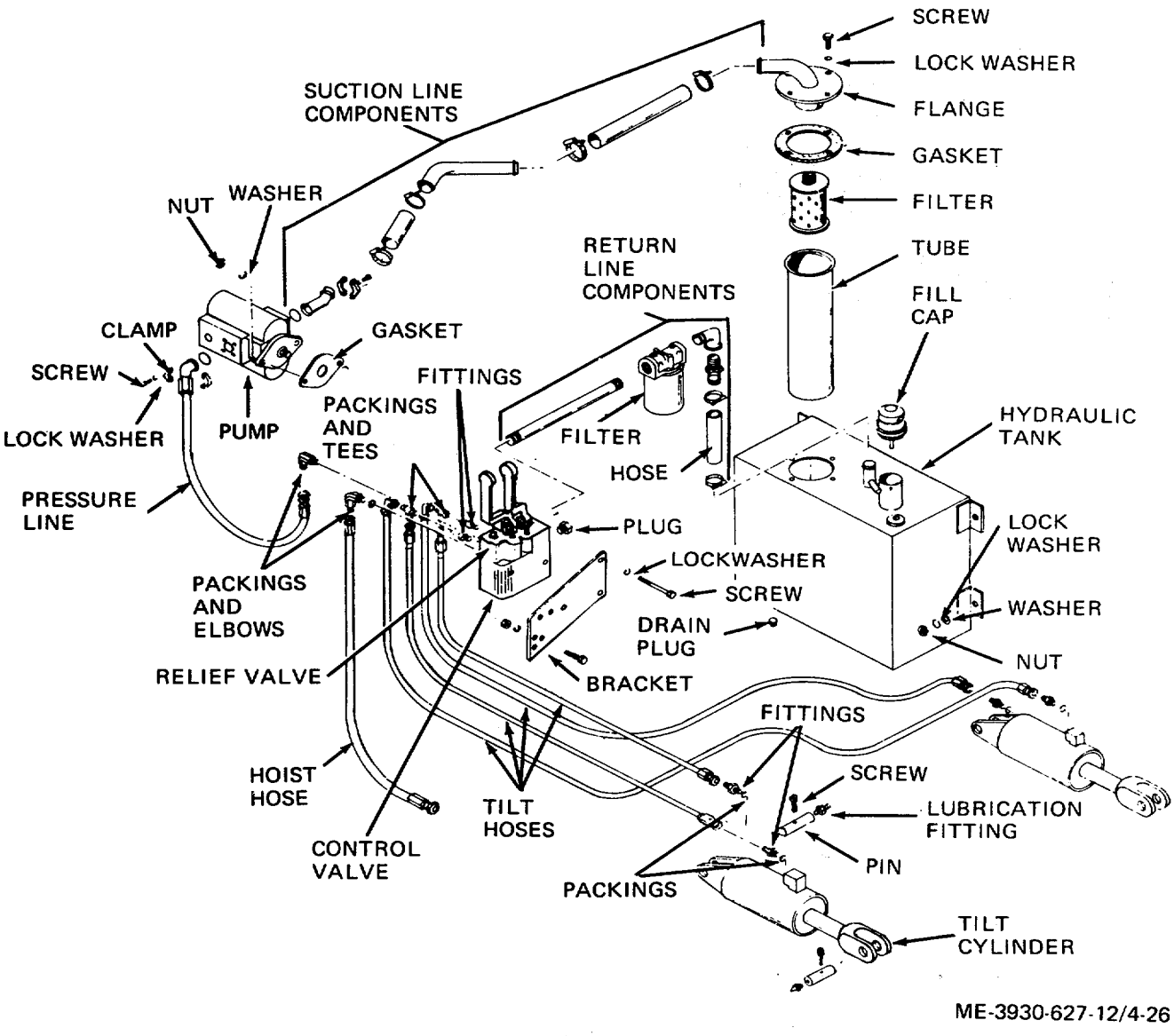


Figure 4-26. Hydraulic system layout.

4-51. Levers and Linkage Adjustment

There is no provision for adjustment of these parts.

4-52. Hydraulic Tilt Cylinders

a. Inspection. Inspect tilt cylinders for leaks, secure mounting, proper length adjustment of piston rods, rust or burrs on piston rods, and operation of cylinders.

b. Removal.

(1) Tilt mast back and block it, or tie it to the overhead guard.

(2) Disconnect hoses at tilt cylinders, (fig. 4-26) and strip cylinders of fittings for use at installation.

(3) Remove pin lock screws from front and rear tilt cylinder pins, support cylinders against dropping, and remove pins.

(4) Take cylinders from truck. Save pins, lubrication fittings and lock screws for reuse.

c. Installation. Reverse procedure in *b* above. After installation operate tilt control several times to bleed air from system.

d. Adjustment.

(1) Tilt and block mast fully back.

(2) Disconnect both tilt cylinders at mast. Be sure plungers are fully retracted.

(3) With plungers fully retracted, holes in piston rod devises should align with mounting holes on uprights so pins can be entered without moving parts to get them in line. If necessary, loosen clamp bolt on clevis, hold piston rod at flat provided and screw clevis in or out until holes are lined up.

(4) Reconnect tilt cylinders to uprights.

4-53. Lift Chains

a. Removal.

(1) Remove the forks from the carriage.

(2) Raise the lift carriage (6, fig. 4-27) about 6 inches from the floor and block the carriage to remove tension from the chains.

(3) Remove nut (7) and jamnut (8) from adjusting screw (9) and remove screw from cylinder flange.

(4) Remove pins (3) from link (2) and remove link plate (5). Remove chain assembly (1) from carriage anchor (4).

(5) Remove the chain with the screw from the mast assembly.

KEY to figure 4-27:
1. Chain
2. Link
3. Pin
4. Carriage anchor
5. Link plate
6. Lift carriage
7. Nut
8. Jamnut
9. Adjusting screw

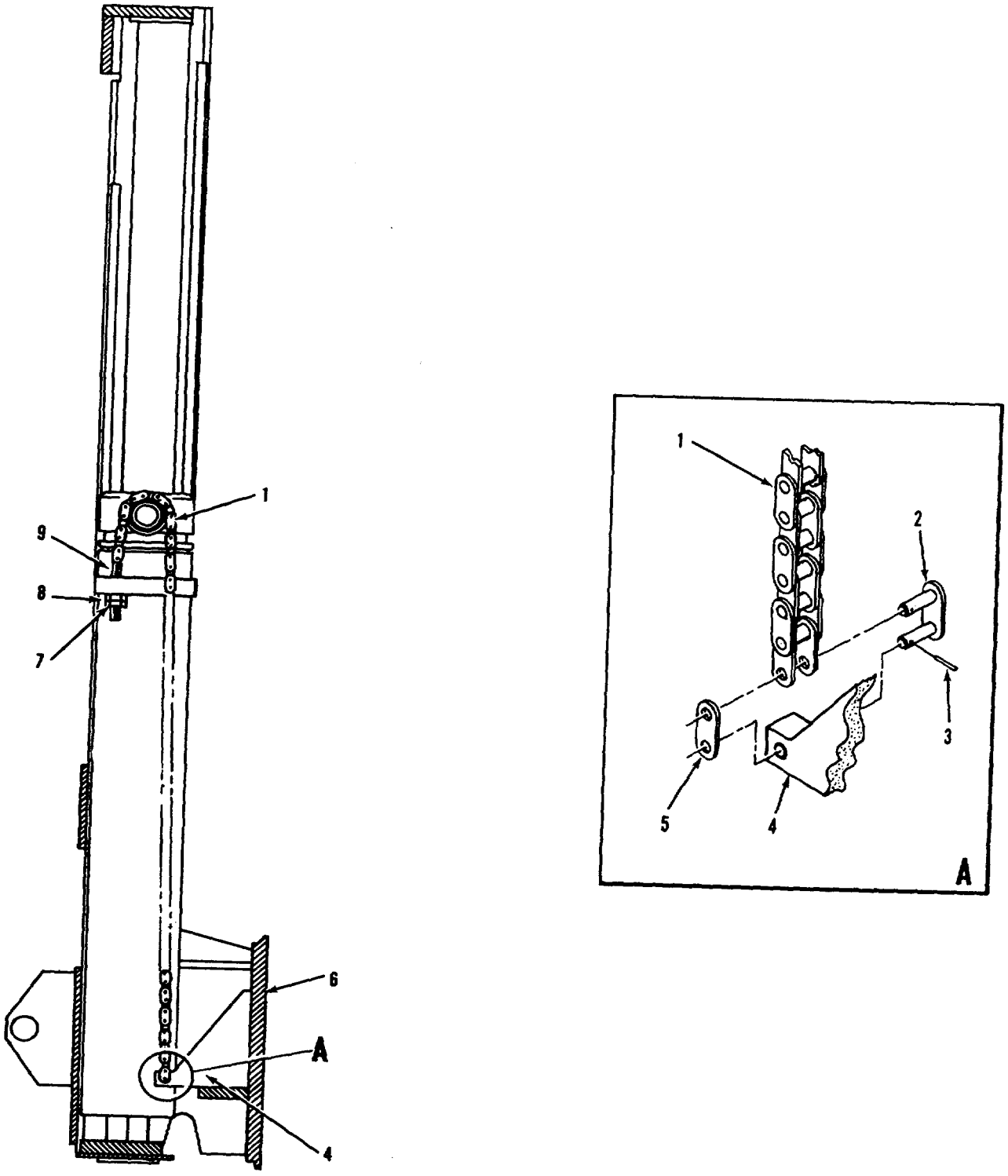


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Figure 4-27. Lift chains.

b. Cleaning.

(1) Soak and wash chains in SD. Use a stiff brush to remove hard or caked dirt and grease.

(2) Hang chains and let them drain until dry.

c. Inspection. Inspect chains for pitted or broken rollers, elongation, and defective connecting links. Install serviceable chains as necessary.

d. Installation.

(1) Soak chains in OE-10.

(2) Hang chains and let them drain. Wipe outer surfaces of chains of excess oil before installing them.

(3) Reverse procedure in a above.

e. Adjustment.

(1) With no load on forks move forks to their extreme width.

(2) Lower forks completely.

(3) Move upright to vertical position.

(4) Adjust the chain anchor rods into chain anchors as far as threads will allow, by tightening chain anchor rod nuts.

(5) Fork-to-floor clearance will range from 0 to 3/4 inch, depending on tire wear and machine tolerances.

(6) Raise the inner rail assembly to its fullest height and check the clearance between the inner rail stops and the outer rail stop blocks. If the stop blocks are touching, readjust the nuts until a clearance of at least 1/8 inch is obtained.

(7) Adjust nuts until deflection is equal with the same tension applied to each chain at the same height. Keep nut and jamnut as close to end of anchor stud as possible and still obtain above adjustments. This will allow lowest possible position of forks. Tighten jamnuts.

4-54. Oil Tank and Breathe.

a. Maintain level of OE to mark on dipstick at time mast is tilted back and hoist is fully lowered.

b. Tank is vented through the fill cap, which contains a filter element. In normal service, remove the fill cap and soak it in SD each 500 hours of operation to remove accumulated dirt. When the truck is used in dusty areas, clean as often as needed.

c. Referring to figure 4-26, note the suction line filter, shown removed from inside the tank. At least each 1000 hours clean this filter.

4-55. Return Line (Pressure) Filter

Each 500 hours of operation replace this filter element.

4-56. Lines and Fittings

Inspect all hydraulic fittings and lines as given in MIL-STD 166, Visual Inspection Guide for Rubber Hose. Refer to figure 4-26 for guidance in removing lines and fittings.

Warning: **Lower forks fully and tilt mast forward before loosening any hydraulic hose fitting. Loss of pressure trapped in line may let mast tilt or carriage lower by gravity, with the risk of injury.**

CHAPTER 5

ADMINISTRATIVE STORAGE AND DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

Section I. ADMINISTRATIVE STORAGE

5-1. General
Refer to TM 740-90-1 for all information on administrative storage applicable to the fork lift truck.

Section II. DEMOLITION

5-2. General
Do not destroy the truck except on order of proper authority, and demolish it only to prevent capture and use of the truck by the enemy. Destroy the same parts on all similar equipment to prevent enemy use through cannibalization.

5-3. Methods

a. Controls. Smash all controls, including steering wheel.

b. Gasoline Engine. Pierce or smash cylinder block. Damage crankshaft and camshaft.

c. Transmission and Differential. Pierce or smash transmission and differential case.

d. Steering Gear. Pierce or smash steering gear housing.

e. Wires, Cables, and Lines. Cut, rip out, or otherwise destroy all wires, electrical cables, and fuel, oil, or water lines.

f. Carburetor and Manifolds. Smash these assemblies.

g. Alternator, Distributor, Ignition Coil, and Spark Plugs. Destroy these components by smashing.

h. Radiator. Drive large holes through core and tank. Break off drain cock.

i. Battery. Break case and plates of battery.

APPENDIX A

REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users

A-2. Lubrication

C9100-IL	Identification List for Fuels, Lubricants, Oils and Waxes
LO 10-3930-627-12	Lubrication Order

A-3. Painting

TM 9-213	Painting Instructions for Field Use

A-4. Radio Suppression

TM 11-483	Radio Interference Suppression

A-5. Maintenance

TM 9-1870-1	Care and Maintenance of Pneumatic Tires
TB 750-651	Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems
TM 38-750	The Army Maintenance Management Systems
TM 10-3930-627-20P	Organizational Maintenance Repair Parts and Special Tools List
TM 9-6140-200-15	Maintenance of Storage Batteries, Lead Acid Type

A-6. Shipment and Storage

TM 740-90-1	Administrative Storage of Equipment
TB 740-97-2	Preservation of USAMEC Mechanical Equipment for Shipment and Storage

A-7. Destruction to Prevent enemy Use

TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

B-2. Explanation of Columns in Section II

a. Group Number, Column (1). The assembly group is a numerical group assigned to each assembly in a top down breakdown sequence. The applicable assembly groups are listed on the MAC in disassembly sequence beginning with the first assembly removed in a top down disassembly sequence.

b. Assembly Group, Column (2). This column contains a brief description of the components of each assembly group.

c. Maintenance Functions, Column (3). This column lists the various maintenance functions (A through K) and indicates the lowest maintenance category authorized to perform these functions. The symbol designations for the various maintenance categories are as follows:

C-Operator or crew
O-Organizational maintenance
F-Direct support maintenance
H-General support maintenance
D-Depot maintenance

The maintenance functions are defined as follows:

A-Inspect: To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

B-Test: To verify serviceability and to detect electrical or mechanical failure by use of test equipment.

C-Service: To clean, to preserve, to charge, and to add fuel. lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.

D-Adjust: To rectify to the extent necessary to bring into proper operating range.

E-Align: To adjust specified variable elements of an item to bring to optimum performance.

F-Calibrate: To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

G-Install: To set up for use in an operational environment such as an emplacement, site, or vehicle. H-Replace: To replace unserviceable items with serviceable like items.

I-Repair: Those maintenance operations necessary to restore an item to serviceable condition through correction of material damage or a specific failure. Repair may be accomplished at each category of maintenance.

J-Overhaul: Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

K-Rebuild: The highest degree of material maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

d. Tools and Equipment, Column (4). This column is provided for referencing by code the special tools and test equipment (sec. III) required to perform the maintenance functions (sec. II).

e. Remarks, Column (5). This column is provided for referencing by code the remarks (sec. IV) pertinent to the maintenance functions.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Functional Group	(3) Maintenance functions											(4) Tools and equipment	(5) Remarks
		A Inspect	B Test	C Service	D Adjust	E Align	F Calibrate	G Install	H Replace	I Repair	J Overhaul	K Rebuild		
01	ENGINE													
	Engine Assembly	0	0	C	0				F	0	H	D		
	Cylinder Head								0	F				
	Crankshaft								H	D				
	Flywheel Assembly								F	H				
	Valve, Engine				0				F	F				
	Gears, Timing	F							F					
	Breather			0					0					
	Filter, Oil			0					0					
	Pump, Oil	F							F					
	Manifold	0							0					
02	FUEL SYSTEM													
	Carburetor				0				0	F				
	Fuel Pump		0	0					0					
	Air Cleaner			C					0					
	Tank, Fuel			C					0	H				
	Governor				0				F	F				
	Pedal & Linkage, Accelerator				0				0					
03	EXHAUST SYSTEM													
	Muffler & Pipe	F							F					
	Hose	0							0					
04	COOLING SYSTEM													
	Radiator		H	C					0	H				
	Thermostat		0						0					
	Water Pump	0							0					
	Belt, Fan				0				0					
05	ELECTRICAL SYSTEM													
	Alternator		0						0	F				
	Regulator Voltage		0		0				0					
	Starting Motor		F						0	F				
	Distributor				0				0	0				
	Spark Plugs		0	0	0				0					
	Ignition Coil		0						0					
	Battery		0	C					0					
	Cables Battery			0					0					
06	TRANSMISSION													
	Torque Converter			0					F					
	Transmission Assembly		F	C					F	F	H	D		
	Control Valve		F						F	F				
	Inching Control				F					F				
07	FRONT AXLE													
	Front Axle Assy (Drive)			0					F	F				
	Differential				F				F	H				
08	REAR AXLE													
	Rear Axle Assy (Steering)			0	F				F	F				
09	BRAKES													
	Lever, Hand Brake				0				0					
	Cable, Hand Brake				0				0					
	Brake Shoes, Service Brake				0				0					
	Master Cylinder			0					0	F				
	Wheel Cylinder								0	F				
	Pedal				0				F					

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Functional Group	(3) Maintenance functions											(4) Tools and equipment	(5) Remarks
		A Inspect	B Test	C Service	D Adjust	E Align	F Calibrate	G Install	H Replace	I Repair	J Overhaul	K Rebuild		
	Rims	0							0					
	Hubs and Drums								0	F				
	Bearings and Seals		0	0					0					
	Tires, Tubes	0							0	0				
11	STEERING													
	Drag Link				0				0	0				
	Tie Rod			0	F				0	0				
	Gear Assembly Steering			0	F				F	F				
12	HYDRAULIC LIFT COMPONENTS													
	Hydraulic Pump								F	F				
	Control Valve				0				F	F				
	Control Levers & Linkage	0							F					
	Tilt Cylinder				0				0	F				
	Lift Cylinder								F	F				
	Mast Assembly								F	F				
	Carriage Assembly								F	F				
	Chain Hydraulic Lift				0				0	0				
	Lines and Fittings	0							0					
	Tank, Oil			0					F	H				
	Breather, Oil Tank			0					0					
	Filter, Oil			0					0					

APPENDIX C

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists items which accompany the truck or are required for installation, operation, or operator's maintenance.

C-2. General

This basic issue items list is divided into the following sections:

a. Basic Issue Items-Section II. A list of items which accompany the truck and are required by the operator/crew for installation, operation, or maintenance.

b. Maintenance and Operating Supplies-Section III.A listing of maintenance and operating supplies required for initial operation.

C-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of basic issue items, section II.

a. Source, Maintenance, and Recoverability Codes (SMR), Column (I). This list does not require use of this column.

b. Federal Stock Number, Column (2). This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description, Column (3). This column indicates the Federal item name and any additional description of the item required.

d. Unit of Measure (U/ M), Column (4). A two-character alphabetic abbreviation indicating the amount of quantity of the item upon which the allowances are based; e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit, Column (5). This column indicates the quantity of the item used in the functional group or the assembly group.

f. Quantity Furnished With Equipment, Column (6.) This column indicates the quantity of an item furnished with the equipment.

g. Illustration, Column (7). This column is divided as follows:

(1) *Figure number, column (7) (a).* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number, column (7) (b).* Indicates the callout number used to reference the item in the illustration.

C-4. Explanation of Columns in the Tabular List of Maintenance and Operating Supplies-Section III

a. Component Application, Column (1). This column identifies the component application of each maintenance or operating supply item.

b. Federal Stock Number, Column (2). This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description, Column (3). This column indicates the item name and brief description.

d. Quantity Required for Initial Operation, Column (4).This column indicates the quantity of each maintenance or operating supply item required for initial operation of the equipment.

e. Quantity Required for 8 Hours' Operation, Column (5). This column indicates the estimated quantities required for an average 8 hours of operation.

f. Notes, Column (6). This column indicates informative notes keyed to data appearing in a preceding column.

Section II. BASIC ISSUE ITEMS

(1) SMR code	(2) Federal stock number	(3) Description Ref No.& Mfr Code Usable on code	(4) Unit of meas	(5) Qty inc in unit	(6) Qty furn with equip	(7) Illustration (A) Fig No.	(7) Illustration (B) Item No.
	7510-889-3494	Binder, Loose Leaf	EA	1	1		
	7520-559-9618	Case, Maintenance and Operating Manuals	EA	1	1		
	4210-889-2221	Extinguisher, Fire, 2 ½ lb., Fed Spec. 0-395	EA	1	1		
		Department of the Army Technical Manual TM 10-3930-627-12					
		Department of the Army Lubrication Order LO 10-3930-627-12					

MAINTENANCE AND OPERATING SUPPLIES

(1) COMPONENT APPLICATION	(2) MFR PART NO OR NAT'L STOCK NO.	(3) DESCRIPTION	(4) QTY REQ F/INITIAL OPN	(5) QTY REQ F/8 HRS OPN	(6) NOTES
Air Cleaner		Oil Lubricating: 5 Gal Drum as follows:			(1) Includes quantity of oil to fill engine oil system as follows 3-1h qts.--crankcase 1 qt.--oil filter (2) See C9100 IL for additional data and requisitioning procedures. (3) See current LO for grade application and replenishment intervals. (4) Fuel tank capacities.
	9150-265-9435(2)	OE30		(3)	
	9150-265-9428(2)	OEIO		(3)	
	9150-242-7603(2)	OES		(3)	
Crankcase		Oil Lubricating (1)		(2)	
	9150-265-9435(2)	OE30		(3)	
	9150-265-9428(2)	OE10		(3)	
	9150-242-7603(2)	OES		(3)	
Hydraulic Brake Cylinder		Brake Fluid: Automotive 1 gallon can as follows:			
	9150-252-6375(2)	HBA	1/2 pt.	(3)	
Hydraulic Reservoir		Oil Lubricating: 55 gallon drum as follows:			
	9150-265-9430(2)	OE10		(3)	
	9150-242-7605(2)	OES		(3)	
Radiator		Water			
		Antifreeze 5 gallon can as follows:			
	6850-244-8730	Ethylene Glycol type 1 Antifreeze:			
		55 gallon drum as follows:			
	6850-174-1806	Arctic grade			
Fuel Tank		Fuel, Gasoline: bulk as follows:			
	9130-160-1818(2)	Automotive Combat 91A		(4)	
	9130-160-1830(2)	Automotive Combat 91C		(4)	
Transmission and Differential		Oil Lubricating: 55 gallon drum as follows:			
	9150-265-9430(2)	OEIO		(3)	
	9150-242-7605(2)	OES		(3)	
Grease Points		Grease, Automotive and Artillery: 5 lb. can as follows:			
	9150-190-0905(2)	GAA			

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