
DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
FOR

TRUCK, LIFT, FORK, GASOLINE ENGINE DRIVEN,

SOLID RUBBER TIRES, 127 INCH LIFT,

2000 POUND CAPACITY

(ARMY MODEL MHE-229)

(CLARK EQUIPMENT MODEL 2329397)

NSN 3930-00-315-9699

This copy is a reprint which includes current
pages from Change 1.

HEADQUARTERS, DEPARTMENT OF THE ARMY

30 APRIL 1975

TECHNICAL MANUAL

No. 10-3930-632-34

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 April 1975**DIRECT SUPPORT AND GENERAL SUPPORT****MAINTENANCE MANUAL****TRUCK, LIFT, FORK, GASOLINE****ENGINE DRIVEN, SOLID RUBBER TIRES,****127 INCH LIFT, 2000 POUND CAPACITY****(ARMY MODEL MHE-229)****(CLARK EQUIPMENT MODEL 2329397)****NSN 3930-00-315-9699**

		Paragraph	Page
CHAPTER 1.	INTRODUCTION		
Section I.	General	1-1	1-1
Section II.	Description and Data	1-6	1-1
CHAPTER 2.	DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS		
Section I.	Repair Parts, Special Tools and Equipment.....	2-1	2-1
Section II.	Troubleshooting	2-2	2-1
Section III.	Removal and Installation of Major Components and Accessories	2-3	2-5
CHAPTER 3.	REPAIR OF MAST ASSEMBLY		
Section I.	General Description	3-1	3-1
CHAPTER 4.	REPAIR OF HYDRAULIC SYSTEM		
Section I.	General Description	4-1	4-1
Section II.	Lift Cylinder.....	4-2	4-1
Section III.	Hydraulic Pump	4-8	4-3
Section IV.	Hydraulic Control Valve	4-15	4-7
Section V.	Tilt Lock Valve	4-23	4-10
Section VI.	Carriage, Lift Chains and Rollers.....	4-28	4-11
Section VII.	Hydraulic Oil Tank	4-34	4-13
CHAPTER 5.	REPAIR OF ELECTRICAL SYSTEM		
Section I.	Alternator	5-1	5-1
Section II.	Starter Motor.....	5-7	5-3
CHAPTER 6.	REPAIR OF FUEL SYSTEM		
Section I.	Description.....	6-1	6-1
Section II.	Carburetor.....	6-2	6-1
Section III.	Governor	6-8	6-4
Section IV.	Fuel Tank.....	6-12	6-5
CHAPTER 7.	REPAIR OF COOLING SYSTEM		
Section I.	Radiator	7-1	7-1
CHAPTER 8.	REPAIR OF STEERING GEAR		
Section I.	General Description	8-1	8-1
Section II.	Repair	8-2	8-1

	Paragraph	Page
CHAPTER 9. REPAIR OF ENGINE		
Section I. Description.....	9-1	9-1
II. Engine Wear Limits	9-2	9-1
III. Torque Specifications	9-3	9-2
IV. Engine Overhaul.....	9-4	9-3
V. Cylinder Head	9-5	9-3
VI. Intake and Exhaust Valves	9-10	9-5
VII. Oil Pan, Oil Pump, and Filler Blocks.....	9-14	9-10
VIII. Gear Cover and Idler Gear	9-18	9-13
IX. Flywheel and Flywheel Housing	9-22	9-16
X. Pistons and Connecting Rod	9-26	9-18
XI. Main Bearing and Crankshaft	9-30	9-20
XII. Camshaft	9-34	9-23
XIII. Cylinder Block	9-38	9-25
CHAPTER 10. WHEELS AND TIRES		
Section I. Description.....	10-1	10-1
CHAPTER 11. REPAIR OF BRAKES		
Section I. Description.....	11-1	11-1
II. Brake Pedal and Linkage.....	11-2	11-1
III. Brake Master Cylinder	11-4	11-3
IV. Wheel Cylinder	11-12	11-4
V. Hand Brake Shoes	11-18	11-5
VI. Service Brakes	11-22	11-7
CHAPTER 12. REPAIR OF FRONT AXLE		
Section I. General Description	12-1	12-1
II. Drive Axle Ends	12-2	12-1
III. Axle Adapter and Differential	12-5	12-2
CHAPTER 13. REPAIR OF REAR AXLE		
Section I. General Description	13-1	13-1
II. Tie Rods	13-2	13-1
III. Rear (Steer) Axle	13-5	13-2
CHAPTER 14. REPAIR OF TRANSMISSION		
Section I. Control Lever and Linkage.....	14-1	14-1
II. Transmission Overhaul.....	14-6	14-3
APPENDIX A. REFERENCES		A-1

INDEX

LIST OF ILLUSTRATIONS

Title

Fig. No.

Page

1-1.	Fork Lift Truck, Right Side View.....	1-2
1-2.	Fork Lift Truck, Left Side View.....	1-3
2-1.	Top Front View of Engine.....	2-6
2-2.	Right Hand View of Engine.....	2-7
2-3.	Engine Mount, Exploded View.....	2-8
2-4.	Torque Converter and Drive Plates, Exploded View.....	2-9
2-5.	Carriage Load Backrest and Forks, Exploded View.....	2-10
2-6.	Chain Anchors, Removal and Installation.....	2-11
2-7.	Mast Assembly, Removal and Installation.....	2-12
2-8.	Steering Gear, Removal and Installation.....	2-14
2-9.	Steering Gear Showing Adjustment Points.....	2-15
2-10.	Axle Adapter, Removal and Installation.....	2-16
2-11.	Ring Gear and Pinion Tooth Contact Patterns.....	2-17
2-12.	Transmission Test Setup.....	2-19
2-13.	Steering Axle and Linkage Adjustment.....	2-21
3-1.	Mast Assembly, Exploded View.....	3-2
4-1.	Lift Cylinder, Exploded View.....	4-2
4-2.	Hydraulic Pump, Exploded View.....	4-4
4-3.	Hydraulic Pump Test Setup.....	4-6
4-4.	Inlet Valve Section, Exploded View.....	4-8
4-5.	Outlet Valve Section, Exploded View.....	4-9
4-6.	Tilt Lock Valve, Exploded View.....	4-10
4-7.	Lift Chains and Rollers, Exploded View.....	4-12
5-1.	Alternator, Exploded View.....	5-2
5-2.	Starter Motor, Exploded View.....	5-4
5-3.	Circuit for Checking Pinion Clearance.....	5-6
5-4.	Engine Starter No-Load Test Setup.....	5-7
6-1.	Carburetor, Exploded View.....	6-2
6-2.	Float Level Adjustment.....	6-3
6-3.	Governor Assembly, Exploded View.....	6-4
8-1.	Steering Gear, Exploded View.....	8-1
9-1.	Cylinder Head, Exploded View.....	9-4
9-2.	Cleaning Carbon from Combustion Chamber.....	9-5
9-3.	Checking Cylinder Head Flatness Lengthwise.....	9-5
9-4.	Checking Cylinder Head Flatness Crosswise.....	9-5
9-5.	Cylinder Head Bolt Tightening Sequence.....	9-5
9-6.	Valves and Camshaft, Exploded View.....	9-6
9-7.	Removing Valve Guides.....	9-7
9-8.	Valve Guide Installation Dimensions.....	9-8
9-9.	Pulling Valve Seat Insert.....	9-9
9-10.	Grinding Valve Seat.....	9-9
9-11.	Checking Valve Seat Runout.....	9-9
9-12.	Narrowing Valve Seat.....	9-9
9-12.1.	Valve Adjustment.....	9-10
9-13.	Oil Pan and Oil Pump, Exploded View.....	9-10.1
9-14.	Installing Neoprene Gasket on Rear Filler Block.....	9-11
9-15.	Rolling Seal into Filler Block.....	9-11
9-16.	Lower Half of Ring Seal Installed in Rear Filler Block.....	9-11
9-17.	Filler Blocks Installed on Engine.....	9-12
9-18.	Installing Neoprene Seal on Front Filler Block.....	9-12
9-19.	Gear Cover and Idler Gear, Exploded View.....	9-14
9-20.	Piston, Connecting Rod, Crankshaft, and Flywheel, Exploded View.....	9-15
9-21.	Checking Flywheel Runout.....	9-17
9-22.	Checking Flywheel Eccentricity.....	9-17
9-23.	Checking Flywheel Housing Runout.....	9-17
9-24.	Checking Flywheel Housing Eccentricity.....	9-18
9-25.	Checking Piston Fit in Cylinder Bore.....	9-19
9-26.	Cylinder Block and Related Parts, Exploded View.....	9-21
9-27.	Removing Upper Bearing Shell with Angular Pin.....	9-22
9-28.	Checking Bearing Clearance with Plastic gage.....	9-23
9-29.	Checking Bearing Clearance with Shim Stock.....	9-23
9-30.	Timing Gears Showing Alignment Marks.....	9-24
9-31.	Checking Timing Gear Clearance.....	9-25
10-1.	Wheel and Tire, Exploded View.....	10-1
11-1.	Brake Pedal and Linkage, Exploded View.....	11-2
11-2.	Service Brake Master Cylinder, Exploded View.....	11-3

<i>Fig. No</i>	<i>Title</i>	<i>Page</i>
11-3.	Inching Brake Master Cylinder, Exploded View	11-4
11-4.	Wheel Cylinder, Exploded View	11-5
11-5.	Parking Brake Assembly, Exploded View	11-6
11-6.	Service Brake Assembly, Removal and Installation	11-8
12-1.	Axle End, Disassembly and Reassembly	12-2
12-1.1.	Axle Adapter and Differential	12-3
13-1.	Tie Rod, Disassembly and Reassembly	13-2
13-1.1.	Rear Steering Axle Assembly, Exploded View	13-3
14-1.	Transmission Control Lever and Linkage, Exploded View	14-2
14-2.	Transmission Assembly, Exploded View	14-4
14-3.	Reverse Clutch Pack, Exploded View	14-5
14-4.	Forward Clutch Pack, Exploded View	14-6
14-5.	Transmission Torque Converter Housing and Related Parts, Exploded View	14-7
14-6.	Control Valve, Exploded View	14-9
14-7.	Control Valve Associated Parts, Exploded View	14-10
14-8.	Assembling Forward and Reverse Clutches	14-11
14-9.	Input Shaft Installation	14-12
14-10.	Torque Converter Housing Showing Pump and Seals	14-12

LIST OF TABLES

Table	Title	Page
2-1.	Troubleshooting	2-1
9-1.	Engine Wear Limits.....	2-1
9-2.	Torque Specifications	9-1
14-1.	Transmission Spring Inspection.....	9-3
		14-11

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for your use in maintaining the Army Model MHE-229 Fork Lift Truck.

1-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use: DA Form 2408 (Equipment Log Assembly-Records), DA Form 2408-1 (Equipment Daily and Monthly Log), DA Form 2408-5 (Equipment Modification Record), DA Form 2408-9 (Equipment Control Record), DA Form 2408-10 (Equipment Component Register), and DA Form 2408-14 (Uncorrected Fault Record).

1-3. Reporting of Errors

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, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Tank-Automotive Command, Warren, MI 48090, Attn: DRST-MB. A reply will be furnished to you.

1-4. Destruction of Army Material to Prevent Enemy Use

a. 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.

b. Methods.

(1) Controls. Smash all controls, including

steering wheel.

(2) Gasoline Engine. Pierce or smash cylinder block. Damage crankshaft and camshaft.

(3) Transmission and Differential. Pierce or smash transmission and differential case.

(4) Steering Gear. Pierce or smash steering gear housing.

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

(6) Carburetor and Manifolds. Smash these assemblies.

(7) Alternator, Distributor, ignition Coil, and Spark Plugs. Destroy these components by smashing.

(8) Radiator. Drive large holes through core and tank. Break off drain cock.

(9) Battery. Break cam and plates of battery.

1-5. Administrative Storage

a. Select the best available site for administrative storage. Separate stored equipment from equipment in use. Conspicuously mark the area "Administrative Storage".

b. Covered space is preferred. When sufficient covered space for all items to be stored is not available, priority should be given to items which are most susceptible to deterioration from the elements. SB 38-8-1 should be used as a guide for establishing the items most susceptible to deterioration.

c. Open sites should be improved hardstand, if available. Unimproved sites should be firm, well-drained, and kept free of excessive vegetation.

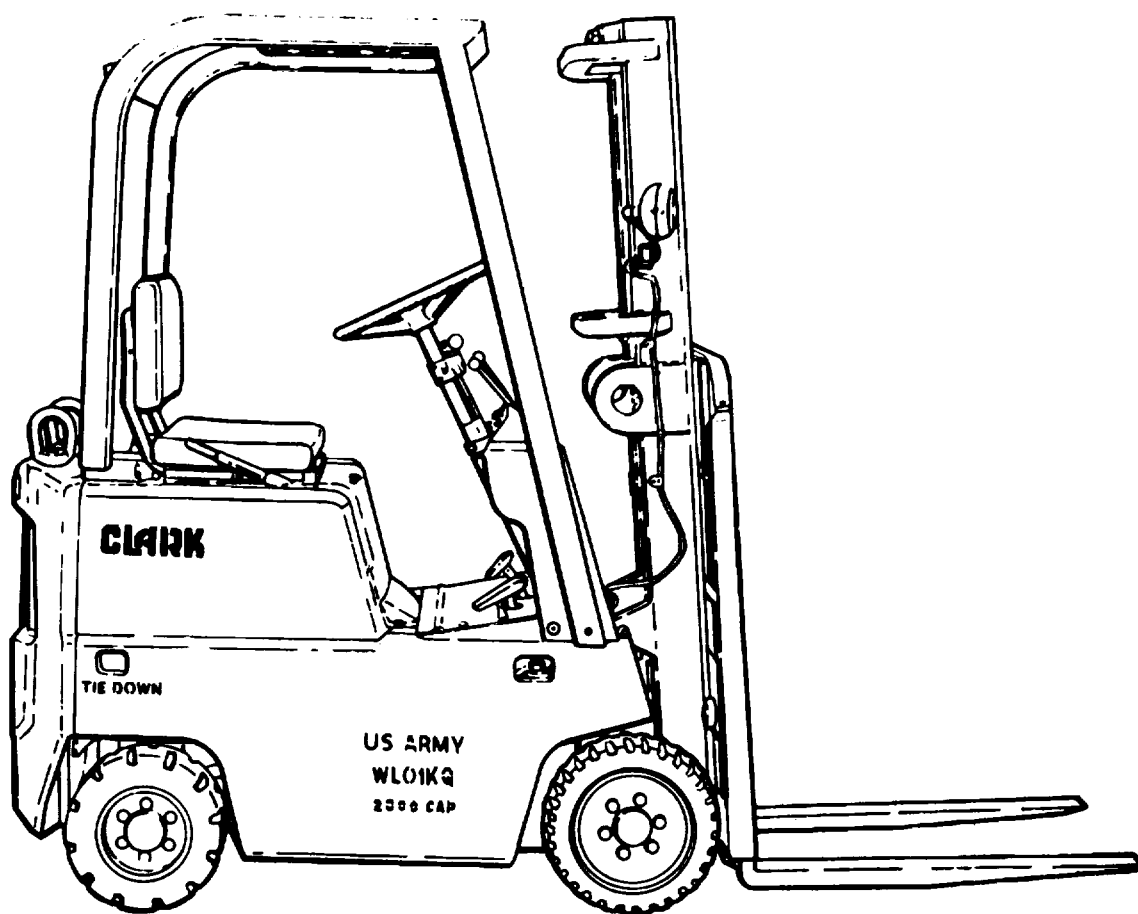
d. Trucks, vans, CONEX containers, and other containers may be used if they provide the best available protection.

Section II. DESCRIPTION AND DATA

1-6. Description

a. general The fork lift truck (fig. 1-1 and 1-2) is a four cylinder gasoline engine driven, torque converter coupled, solid rubber tire-mounted unit. The fork lift truck utilizes hydraulic power for its lift and tilt functions.

The truck has a rated capacity of 2000 pounds, and is designed for high maneuverability and operation in confined areas. The maintenance paragraphs of this manual contain detailed descriptions of the various components of the truck.



TA227258

Figure 1-1. Fork Lift Truck, Right side View.

Change 1 1-2