

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT

MAINTENANCE MANUAL

TRUCK, LIFT, FORK; GASOLINE ENGINE DRIVEN;
PNEUMATIC-TIRED WHEELS; 6000 LB CAPACITY;
168 INCH LIFT; ALLIS-CHALMERS MODEL FP60-24PS;
ARMY MODEL MHE213 FSN 3930-935-7979

This copy is a reprint which includes current
pages from Changes 2 and 3.

HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1971

TECHNICAL MANUAL

No. 10-3930-618-34



HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 12 May 1971

DIRECT SUPPORT AND GENERAL SUPPORT**MAINTENANCE MANUAL**

**TRUCK, LIFT, FORK; GASOLINE ENGINE DRIVEN;
PNEUMATIC - TIRED WHEELS;
6000 LB CAPACITY; 168 INCH LIFT; ALLIS-CHALMERS
MODEL FP60-24PS;
ARMY MODEL MHE213 FSN 3930-93S-7979**

			Paragraph	Page
CHAPTER	1.	General	1-1 1-3	1-1
Section	I.	Description and data	1-4 1-5	1-1 1-2
	II.	INTRODUCTION		
CHAPTER	2.	DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS		
Section	I.	Repair parts, special tools and equipment	2-1 2-3	2-1
	II.	Troubleshooting	2-4 2-5	2-1 2-5
	III.	General maintenance	2-6 2-7	2-5
	IV.	Removal and installation of major components and auxiliaries	2-8 2-15	2-5 2-17
CHAPTER	3.	REPAIR OF POWER PLANT		
Section	I.	Repair of engine electrical system	3-1 3-4	3-1 3-7
	II.	Repair of cooling system	3-5 3-6	3-7 3-8
	III.	Repair of engine fuel system	3-7 3-10	3-7 3-14
	IV.	Repair of engine lubrication system	3-11 3-14	3-15 3-20
	V.	Repair of torque converter and pump	3-15	3-20 3-24
	VI.	Repair of transmission	3-16 3-17	3-24 3-36
	VII.	Repair of engine	3-18 3-26	3-36 3-54
CHAPTER	4.	REPAIR OF HYDRAULIC SYSTEM		
Section	I.	Hydraulic system	4-1 4-4	4-1 4-6
	II.	Repair of hydraulic lift cylinder	4-5 4-6	4-6 4-9
	III.	Repair of lift mast	4-7 4-8	4-10 4-13
CHAPTER	5.	REPAIR OF FRONT AND REAR AXLE ASSEMBLIES		
Section	I.	Repair of steering system	5-1 5-10	5-1 5-16
	II.	Repair of brake system	5-11 5-17	5-16 5-22
	III.	Repair of drive axle	5-18 5-20	5-22 5-26
	IV.	Repair of universal joint	5-21	5-26 5-27
APPENDIX	A.	REFERENCES		
INDEX				

LIST OF ILLUSTRATIONS

Number	Title	Page
2-1	Transmission assembly removal and installation.....	2-7
2-2	Torque converter removal and installation	2-8
2-3	Converter installation	2-8
2-4	Hydraulic pump removal and installation	2-10
2-5	Hydraulic lift assembly removal and installation	2-11
2-6	Tilt cylinder removal and installation.....	2-12
2-7	Hydraulic control valve removal and installation	2-13
2-8	Steering axle assembly removal and installation.....	2-14
2-9	Drive axle assembly removal and installation.....	2-16
3-1	Alternator, exploded view.....	3-1
3-2	Checking rotor and stator for shorts, grounds and open circuits	3-2
3-3	Checking heat sink diodes	3-3
3-4	Brush holder assembly.....	3-4
3-5	Checking alternator output	3-5
3-6	Starter motor disassembly and assembly.....	3-6
3-7	Carburetor disassembly	3-11
3-8	Governor disassembly.....	3-13
3-9	Fuel tank	3-14
3-10	Oil pan, removal 2nd installation	3-16
3-11	Oil pump.....	3-17
3-12	Checking oil pump radial clearance	3-18
3-13	Positioning drive gear offset slot	3-19
3-14	Oil pressure relief valve.....	3-20
3-15	Checking pump and converter pressure	3-21
3-16	Checking clutch pressure	3-21
3-17	Transistor, removal and installation	3-22
3-18	Pump removal and installation	3-23
3-19	Torque converter and pump assembly, disassembly and reassembly	3-23
3-20	Transmission.....	3-25
3-21	Housing and drum assembly removal and installation	3-25
3-22	Forward and reverse disc assembly	3-28
3-23	Transmission control valve.....	3-29
3-24	Single speed transmission, disassembly (sheet 1 of 2).....	3-30
3-24	Single speed transmission, disassembly (sheet 2 of 2)	3-31
3-25	Reverse gear and shaft, removal and installation.....	3-32
3-26	Idler gear shaft, removal and installation.....	3-32
3-27	Output gear and shaft removal and installation	3-32
3-28	Brake pedal (sheet 1 of 2)	3-35
3-28	Brake pedal (sheet 2 of 2)	3-35
3-29	inching pedal	3-36
3-30	Cylinder head and valves	3-38
3-31	Sequence for cylinder head capscrew tightening	3-39
3-32	Cylinder block	3-41
3-33	Crankshaft- gear and pulley.	3-43
3-34	Removing crankshaft	3-43
3-35	Piston and connecting rod.....	3-44
3-36	Intake and exhaust valve assembly.....	3-47
3-37	Valve operating mechanism and camshaft	3-48
3-38	Crankshaft hearing installation	3-52
3-39	Checking camshaft thrust clearance	3-52
3-40	Timing gear cover and rear support	3-53
3-41	Flywheel, ring gear, and housing	3-54
4-1	Hydraulic pump disassembly and reassemble.....	4-3
4-2	Hydraulic control valve	4-5
4-3	Hydraulic reservoir	4-6
4-4	Tilt cylinder.....	4-8
4-5	Hydraulic lift cylinder	4-9
4-6	Hydraulic lift mast.....	4-11
4-7	Hydraulic lift carriage and backrest	4-13
5-1	Steering gear assembly removal and installation (sheet 1 of 2)	5-2
5-1	Steering gear assembly removal and installation (sheet 2 of 2).....	5-3
5-2	Steering gear assembly	5-4
5-3	Checking control spool rotation	5-5
5-4	Removing check valve seal plug	5-6
5-5	Installing entering spring set.....	5-7
5-6	Drive gear alinement	5-8
5-7	Forward reverse lever assembly	5-9

LIST OF ILLUSTRATIONS - Continued

<i>Number</i>	<i>Title</i>	<i>Page</i>
5-8	Power steering cylinder with yoke	5-11
5-9	Steer wheel and bearings. removal and installation.....	5-13
5-10	Steering axle and tie rods.....	5-14
5-11	Stop adjustment	5-16
5-12	Hand brake assembly.....	5-17
5-13	Wheel brake assembly (sheet 1 of 2)	5-18
5-13	Wheel brake assembly (sheet 2 of 2)	5-19
5-14	Brake master cylinder, installed view	5-19
5-15	Master cylinder.....	5-20
5-16	Brake power booster, installed view	5-21
5-17	Brake power booster components	5-22
5-18	Drive axle assembly	5-24
5-19	Drive axle housing and differential	5-25
5-20	Universal joints.....	5-27

CHAPTER I INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual contains instructions for the use of direct support and general support maintenance personnel maintaining the fork lift truck (Allis-Chalmers Model FP60-24PS) as allocated by the Maintenance Allocation Chart. It provides information on equipment maintenance which is beyond the scope of the tools, equipment, personnel, or supplies normally available at organizational maintenance.

1-2. Forms and Records

Maintenance forms, records and reports which are to be

used by maintenance personnel at all maintenance levels are listed in, and prescribed by, TM 38-750.

1-3. Reporting of Errors

Report of errors, omissions, and recommendations for improving this publication by the individual 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-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

Section II. DESCRIPTION AND DATA

1-4. Description

A general description of the fork lift truck is contained in TM 10-3930-618-10. A more detailed description of specific components and assemblies is contained in the applicable sections of this manual. Detailed description of components and assemblies are provided in the applicable maintenance paragraphs of this manual.

1-5. Tabulated Data

a. *Identification.* The major identification plates of the fork lift truck are located and described in TM 10-3930-618-20.

b. *Tabulated Data.*

(1) *Engine assembly.*

ManufacturerAllis-Chalmers
Model.....6MB230
Type.....OHV (overhead valve)
Number of cylinders6
Piston stroke.....4 1 / 8 inches
Bore3 7/16 inches
Compression7.3:1
Piston displacement230 cubic inches
Firing order1-5-3-6-2-4
Governed speed.....2200 rpm (revolutions per minute) under load
Idle speed500 rpm
S.A.E. rated horsepower (HP)
Maximum @ 2200 rpm..... 55.0 hp
Intermittent @ 2200 rpm .. 49.5 hp
Continuous @ 1800 rpm .. 36 hp
LubricationForced feed main and connecting rod bearings with oil filter
Cooling systemPressure-type radiator, with fan and water pump
Electrical system.....12 V dc (volts, direct current)

Fuel feed Mechanical pump is a cam-shaft operated valve and diaphragm type
Air cleaner Oil bath type
Ignition..... Battery and distributor.
distributor gap 0.022 in.
Oil pump:
Type Gear
Pressure..... 70-90 psi (pound per square inch) relief valve bypass
Valves Rotator type
Valve clearance:
Intake (cold) 0.012 in.
Exhaust (cold) 0.014 in.
Intake (hot) 0.010 in.
Exhaust (hot) 0.012 in.
Hydraulic Pump Specifications:
Primary flow 2 to 3 GPM (gallons per minute)
Secondary flow..... 18 to 19 GPM
RPM (Revolutions per minute) 2200
PSI (Pounds per square inch) 2000
Primary flow relief:
Valve set at 1600 $\pm$ 100 PSI
(2) *Torque converter and transmission.*
Manufacturer Allis-Chalmers
(3) *Clutch assembly.*
Manufacturer Allis-Chalmers
(4) *Generator.*
Manufacturer Delco-Remy
(5) *Starter motor.*
Manufacturer Delco-Remy
(6) *Distributor.*
Manufacturer Delco-Remy
(7) *Fuel pump.*
Manufacturer AC Spark Plug Div of General Motors Corp