

TECHNICAL MANUAL

**DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL**

FOR

**TRUCK, LIFT, FORK; DIESEL ENGINE,
PNEUMATIC TIRED WHEELS,
ROUGH TERRAIN, 6,000 LB. CAPACITY
24 " LOAD CENTER
ANTHONY MODEL MLT6-2
ARMY MODEL MHE-230
(NSN 3930-00-327-1575)**

HEADQUARTERS, DEPARTMENT OF THE ARMY
AUGUST 1979

Figure	Title	Page
3-76.	Checking bottom of cylinder head for warpage.	3-55
3-77.	Minimum distance between top and bottom faces of cylinder head.	3-56
3-78.	Alinement of water nozzles in cylinder head	3-56
3-79.	Exhaust valve seal insert installation	3-56
3-80.	Exhaust valve guide installation	3-57
3-81.	Exhaust valve and valve seat insert grinding dimensions	3-57
3-82.	Checking valve seat insert concentricity.	3-57
3-83.	Fuel injector tube installation	3-58
3-84.	Flaring lower end of fuel injector tube.	3-58
3-85.	Reaming fuel injector tube for injector body and spray tip	3-58
3-86.	Checking location of fuel injector spray tip relative to lower surface of cylinder head.	3-58
3-87.	Reaming fuel injector tube for inject nut	3-59
3-88.	Checking cam follower-to-guide clearance.	3-59
3-89.	Positioning cam follower guides	3-59
3-90.	Cylinder head bolt tightening sequence.	3-60
3-91.	Oilpan, removal and installation	3-61
3-92.	Oilpan, disassembly and reassembly	3-62
3-93.	Oil pump screen and inlet pipe, removal, disassembly, reassembly, and installation.	3-62
3-94.	Belt tightener, disassembly and reassembly	3-63
3-95.	Crankshaft pulley and trunnion mount, removal and installation.	3-64
3-96.	Lower front cover, removal and installation	3-65
3-97.	Oilpump, disassembly and reassembly.	3-65
3-98.	Inspecting pump rotor	3-66
3-99.	Installing oil pump drive gear	3-66
3-100.	Lower front cover and oil pump installation	3-67
3-101.	Flywheel and flywheel housing removal, disassembly, reassembly, and installation.	3-67
3-102.	Checking flywheel to flywheel housing runout	3-68
3-103.	Installing oil seal in flywheel housing.	3-68
3-104.	Seal positioning on grooved crankshaft.	3-69
3-105.	Flywheel housing installation	3-69
3-106.	Flywheel housing bolt tightening sequence.	3-70
3-107.	Checking flywheel to flywheel housing concentricity	3-71
3-108.	Pistons and connecting rods, removal and installation	3-73
3-109.	Piston, rings, and connecting rod, disassembly and reassembly	3-74
3-110.	Piston ring, removal and installation	3-74
3-111.	Measuring piston to cylinder liner clearance.	3-75
3-112.	Measuring piston ring gap	3-75
3-113.	Measuring piston ring side clearance.	3-75
3-114.	Piston pin bushing, removal and installation.	3-76
3-115.	Spray nozzle removal	3-76
3-116.	Installing piston pin retainer	3-76
3-117.	Piston assembly, cutaway view.	3-77
3-118.	Camshaft and balance shaft nut, removal and installation	3-78
3-119.	Engine front cover, removal and installation.	3-78
3-120.	Camshaft and balance shaft, disassembly and reassembly	3-79
3-121.	Camshaft gear removal	3-80
3-122.	Camshaft bearing removal	3-80
3-123.	Camshaft bearing installation	3-81
3-124.	Camshaft gear installation	3-81
3-125.	Gear train and timing marks	3-82
3-126.	Idle gear assembly, removal and installation.	3-83
3-127.	Idle gear hub installation	3-83
3-128.	Idle gear installation	3-83
3-129.	Upper and lower main bearing shells, bearing caps, and rear main bearing thrust washers	3-87
3-130.	Crankshaft, timing gear, and main bearings, disassembly and reassembly.	3-88
3-131.	Rearmain bearing cap and bearing, removal and installation.	3-89
3-132.	Rearmain bearing upper shell removal.	3-89
3-133.	Timing gear removal	3-89
3-134.	Oil pump drive gear removal	3-89
3-135.	Crankshaft inspection details	3-90
3-136.	Comparison of main bearing shells	3-91
3-137.	Main bearing shell measurement diagram.	3-91
3-138.	Measuring main bearing thickness.	3-91
3-139.	Crankshaft timing gear installation	3-92
3-140.	Checking crank shaft end play.	3-92

Figure Number	Title	Page
3-141.	Cylinder liner remover	3-93
3-142.	Cylinder liner measurement diagram	3-93
3-143.	Checking bore of cylinder liner	3-93
3-144.	Cylinder liner clamped in place	3-93
3-145.	Installing piston and connecting rod in cylinder liner	3-94
3-146.	Installing piston, connecting rod and cylinder assembly.	3-94
3-147.	Cylinder block, disassembly and reassembly.	3-95
3-148.	Cylinder block measurement diagram.	3-96
4-1.	Regulator valve assembly, removal and installation	4-2
4-2.	Regulator valve assembly, disassembly.	4-2
4-3.	Regulator valve assembly, reassembly.	4-2
4-4.	Charging pump, removal and installation.	4-3
4-5.	Converter charging pump, disassembly and reassembly.	4-3
4-6.	Impeller cover, removal and installation.	4-5
4-7.	Turbine, removal and installation	4-5
4-8.	Reaction member, removal and installation	4-6
4-9.	Impeller and oil baffle, removal and installation.	4-6
4-10.	Impeller and oil baffle, disassembly and reassembly.	4-7
4-11.	Impeller cover, disassembly and reassembly	4-8
4-12.	Turbine and hub, disassembly and reassembly	4-8
4-13.	Oil baffle and hub, disassembly and reassembly	4-9
4-14.	Oil baffle oil seat, removal and replacement	4-9
4-15.	Impeller and hub, disassembly and reassembly.	4-10
4-16.	Stator support, removal and installation.	4-10
4-17.	Output flange, removal	4-11
4-18.	Bearing retainer, output shaft, and gear, removal and installation	4-11
4-19.	Pump adapters, removal and installation	4-11
4-20.	Pump shaft, removal	4-12
4-21.	Stator support, disassembly	4-13
4-22.	Output shaft, disassembly	4-13
4-23.	Pump shafts, disassembly	4-14
4-24.	Converter housing, disassembly	4-14
4-25.	Pump shaft, reassembly	4-14
4-26.	Output shaft, reassembly	4-15
4-27.	Stator support, reassembly	4-15
4-28.	Pump shaft, installation	4-16
4-29.	Control valve assembly, removal and installation.	4-16
4-30.	Transmission control valve assembly, disassembly and reassembly	4-17
4-31.	Transmission parking brake, removal and installation	4-18
4-32.	Transmission parking brake, disassembly and reassembly	4-19
4-33.	Input shaft flange, removal and installation	4-25
4-34.	Front cover, removal and installation	4-26
4-35.	Input shaft and gear, removal and installation	4-26
4-36.	Forward and second clutch, removal and installation.	4-26
4-37.	Rear cover, removal and installation.	4-27
4-38.	Low clutch rear bearing, removal and installation.	4-27
4-39.	Fourth speed clutch, removal and installation.	4-28
4-40.	Reverse and third speed clutch, removal and installation	4-28
4-41.	Low clutch, removal and replacement.	4-29
4-42.	Output shaft and axle disconnect, disassembly and reassembly	4-30
4-43.	Output shaft removal	4-31
4-44.	Transmission case, disassembly and reassembly.	4-32
4-45.	Front cover, disassembly and reassembly	4-33
4-46.	Forward and second clutch, disassembly and reassembly	4-34
4-47.	Forward and second clutch, disassembly details	4-35
4-48.	Fourth speed clutch, disassembly and reassembly.	4-36
4-49.	Fourth speed clutch disassembly details	4-37
4-50.	Reverse and third clutch, disassembly and reassembly	4-38
4-51.	Low clutch, disassembly and reassembly.	4-39
4-52.	Low clutch disassembly details	4-40
4-53.	Transmission case and tubes, disassembly and reassembly.	4-41
4-54.	Tube installation details	4-42
4-55.	Low clutch reassembly details.	4-43
4-56.	Fourth speed clutch reassembly details.	4-44
4-57.	Forward and second speed clutch reassembly details	4-45

Figure Number	Title	Page
4-58.	Output shaft installation detail.	4-46
4-59.	Low clutch rear bearing installations	4-47
4-60.	Transmission rear cover installation	4-47
5-1.	Propeller shaft and yoke flange, removal, and installation.	5-1
5-2.	Front propeller shaft, disassembly and reassembly.	5-2
5-3.	Rear propeller shaft, disassembly and reassembly	5-2
5-4.	Engine propeller shaft, disassembly and reassembly.	5-3
5-5.	Axle assembly, disassembly and reassembly.	5-5
5-6.	Differential lockout shift control, disassembly and reassembly.	5-13
5-7.	Brake assembly, disassembly, and reassembly.	5-15
5-8.	Automatic brake adjuster, disassembly and reassembly	5-16
5-9.	Differential pressure switch and brake valve, removal and installation	5-18
5-10.	Brake valve, disassembly and reassembly.	5-19
5-11.	Hydraulic brake accumulator cylinder, removal and installation	5-20
5-12.	Hydraulic brake accumulator, disassembly and reassembly	5-21
5-13.	Steering cylinders, removal and installation.	5-22
5-14.	Steering cylinder, disassembly and reassembly.	5-23
5-15.	Three-position cylinder, disassembly and reassembly	5-24
5-16.	Rear steering pump, disassembly and reassembly.	5-26
5-17.	Steering mode selector valve, removal and installation.	5-27
5-18.	Steering mode selector valve, disassembly and reassembly.	5-28
5-19.	Steering gear assembly, disassembly, and reassembly	5-29
5-20.	Steering system adjustment	5-30
5-21.	Rear power steering valve, removal, disassembly, reassembly, and installation	5-31
5-22.	Rear drag link, disassembly and reassembly	5-32
6-1.	Three-spool valve, removal and installation.	6-2
6-2.	Three-spool valve, disassembly and reassembly.	6-3
6-3.	Two-spool valve, removal and installation.	6-3
6-4.	Two-spool valve, disassembly and reassembly.	6-4
6-5.	Dual overcenter relief and replenishing valve, removal and installation	6-5
6-6.	Dual overcenter relief and replenishing valve, disassembly and reassembly	6-6
6-7.	Hydraulic lift cylinder, removal and installation.	6-7
6-8.	Hydraulic lift cylinder, disassembly and reassembly.	6-8
6-9.	Hydraulic lift cylinder, removal and installation.	6-9
6-10.	Hydraulic lift cylinder, disassembly and reassembly.	6-10
6-11.	Hydraulic oscillating cylinder, removal and installation	6-11
6-12.	Oscillating cylinder, disassembly and reassembly.	6-12
6-13.	Hydraulic slave cylinder, removal and installation	6-13
6-14.	Hydraulic slave cylinder, disassembly and reassembly	6-14
6-15.	Hydraulic side shift cylinder, removal and installation.	6-15
6-16.	Hydraulic side shift cylinder, disassembly and reassembly.	6-16
6-17.	Hydraulic extension cylinder, removal and installation.	6-17
6-18.	Hydraulic extension cylinder, disassembly and reassembly.	6-18
6-19.	Hydraulic oil reservoir, removal and installation	6-19
6-20.	Hydraulic oil reservoir, disassembly and reassembly	6-20
6-21.	Contamination indicator, removal, disassembly, reassembly, and installation	6-21
6-22.	Hydraulic suction lines, removal, disassembly, reassembly, and installation	6-22
6-23.	Main hydraulic pump, disassembly and reassembly	6-23
6-24.	Engine driven hydraulic pump, disassembly and reassembly	6-24
7-1.	Carriage assembly, disassembly and reassembly.	7-2
7-2.	Boom assembly, disassembly and reassembly	7-3
7-3.	Frame, hood, and panels, disassembly and reassembly (sheet 1 of 2).	7-4
7-4.	Frame, hood, and panels, disassembly and reassembly (sheet 2 of 2)	7-5

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for your use in maintaining the Anthony Co. Model MLT6-2 (Army Model MHE-230) wheel-mounted, rough terrain forklift truck. It provides information on the maintenance of the equipment that is beyond the scope of the tools, equipment, personnel or supplies that are normally available to using organizations.

1-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use are explained in TM 38-750.

1-3. Reporting Errors and Recommending Improvements

a. You can help improve this publication. 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 28 (Recommended Changes to Publication and Blank forms), or DA Form 2028-2 located in the back of this

publication direct to: US Army Tank-Automotive Command, ATTN: DRSTA-MBP, Warren, MI 48090. A reply will be furnished to you.

b. If your forklift 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 USATACOM, ATTN: DRSTA-MVM, Warren, MI 48090. We will send you a reply.

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

Procedures for the destruction of Army material to prevent enemy use are explained in TM 750-244-3.

1-5. Administrative Storage

Administrative storage procedures are explained in TM 740-90-1.

Section II. DESCRIPTION AND DATA

1-6. Description

A general description of the forklift trucks can be found in TM 10-3930-634-12. Repair instructions applicable to Direct and General Support maintenance, and additional descriptive material where required, can be found in the appropriate sections and paragraphs.

1-7. Tabulated Data

a. *Identification and Instruction Plate.* Each forklift truck is provided with a Corps of Engineers "A" plate. This is described in TM 10-3930-634-12.

b. Tabulated Data.

(1) *General.* This subparagraph contains overhaul data that is applicable to direct and general support personnel. A hydraulic diagram (fig. FO- 1) is also included. Refer to TM 10-3930-634-12 for the electrical schematic diagram.

FO- 1. Hydraulic diagram.
(Located in back of manual)

(2) Engine.

ManufacturerDetroit Diesel

Model5043-7000
Series 53N
RPM (revolutions per minute) no load. 2800 ± 15
Stall speed rpm 2280-2310
Firing order 1-3-4-2
Number of cylinders 4
Bore 3.875 in.
Stroke 4.5 in.
Compression ratio 21 to 1
Total displacement- Cu. In 212.4
Number of main bearing 5

(3) Engine Generator.

ManufacturerPrestolite
Volt 24V, dc
Model GHA-48041JT

(4) Transmission.

Manufacturer Clark
Model R8422-1
Type Remote-mounted torque converter.

R a t i n g :

Maximum input speed 3000 rpm
Maximum input torque 300 lb-ft net
Maximum input 175 hp
Rotation, view and from input end
Input Counterclockwise

TM 10-3930-634-34

Output, forward operation. Clockwise
 Gear ranges, selector positions:
 Forward 4 speeds
 Reverse 4 speeds
 Range control 1st, 2nd, 3rd, 4th
 Direction control. Forward, neutral, reverse
 Torque converter:
 Type Single-stage, polyphase, three-element, free-wheeling stator
 Elements Impeller, turbine, stator
 Torque multiplication ratio 3.100 to 1
 Clutch data
 Type Multi-plate, hydraulic-actuated, spring-released, oil cooled
 Material, Reaction plates-steel Friction plates-sintered bronze on steel
 Parking brake
 Size 13X3
 Type Expanding shoe, mechanical
 Rating 23,000 inch-pounds at 1500 pounds apply force
 Flanges:
 Input (remote mount) Mechanics 2A-22314-1
 Rear Mechanics 2A-22485-1
 Front Mechanic 2A-22486-1
 Oil system:
 Oil pump Input driven, gear type, positive displacement
 Oil capacity, U.S. gal 8
 Oil cooler Heat exchanger
 Converter-out oil:
 Temperature 250 °F Maximum
 Main pressure 240 to 280 psi

(5) Generator Regulator.

Manufacturer Prestodite
 Model VBC4004-UT
 Volts 24V, dc

(6) Starter.

Manufacturer Delco-Re
 Voids 24V,

(7) Steering adjustments.

Front steering linkage
 Length between pivot centers. 13 in.
 Rear steering linkage:
 Length between pivot centers 21.484 in.
 Length between grease fittings 21 7/8 in.
 Steering mode cylinder . . Length is adjusted so holes in intermediate link and pitman arm are aligned.
 Front drag link:
 Length between pivot centers 36.6524 in.
 Rear drag link:
 Length between pivot centers 44.31 in.

(8) *Nut, bolt, stud and pipe plug torque data.* The following specifications apply to clean, dry threads. Reduce the torque 10 percent when the threads are clean and oiled.

(a) *Exceptions to standard bolt and nut torque specifications.*

Application	Size nut or bolt	Torque (lb-ft)
Injector Control Shaft Bracket Bolts	1/4-20	10-12
Cam Follower Guide Bolts	1/4-20	12-15
Governor to Flywheel Housing	5/16-18	10-12
Idle Gear Hub and Spacer Bolts	5/16-18	19-23
Idle Gear Hub and Spacer Bolts	3/8-16	40-45
Flywheel housing Bolts	3/8-16	25-39
Injector Clamp Bolts	3/8-16	20-25
Air Box Cover Bolts	3/8-16	12-16
Connecting Rod Nuts Lubricated	3/8-24	40-45
Connecting Rod Nuts (Plain)	3/8-24	50-55
Flywheel Housing Bolts	3/8-24	25-30
Fuel Line Nuts	3/8-24	12-15
Fuel Connector	3/8-24	20-28
Rocker arm Bracket Bolts	7/16-14	50-55
* Flywheel Bolts	1/2-20	110-120
* Main Bearing Cap Bolts	9/16-12	100-130
* Cylinder Head Bolts	5/8-11	170-180
Flange Mounted Air Compressor Drive Shaft Nut	3/4-10	†
Crankshaft End Bolt	3/4-16	200-220
Crankshaft End Bolt (In-Line engines with cone mounted pulleys not stamped with the letter "A")	3/4-16	290-310
Air Compressor Drive Pulley Nut	3/4-16	80-100

†--100 lb-ft plus increase torque to line up cotter pin..

*-Lubricate at assembly with International Compound or equivalent.