

2040 and 2240 Tractor



TECHNICAL MANUAL 2040 and 2240 Tractor

TM1221 (01NOV80) English

John Deere Tractor Works
TM1221 (01NOV80)

LITHO IN U.S.A.
ENGLISH



2040 and 2240 Tractors (Serial No. 350,000L-)

Technical Manual
TM-1221 (Nov-80)

CONTENTS

SECTION 10 — GENERAL

- Group 00 — Specifications and Special Tools
- Group 05 — Pre-delivery, Delivery and After-Sales Inspections
- Group 10 — Lubrication and Periodic Service
- Group 15 — Engine and Tractor Tune-Up
- Group 20 — Tractor Separation

SECTION 20 — ENGINE

- Group 00 — Specifications and Special Tools
- Group 05 — General Information, Diagnosing Malfunctions
- Group 10 — Cylinder Head and Camshaft
- Group 15 — Cylinder Block, Liners, Pistons and Connecting Rods
- Group 20 — Crankshaft, Main Bearings and Flywheel
- Group 25 — Timing Gear Train
- Group 30 — Engine Lubrication System
- Group 35 — Engine Cooling System

SECTION 30 — FUEL SYSTEM

- Group 00 — Specifications and Special Tools
- Group 05 — Diagnosing Malfunctions
- Group 10 — Fuel Tank, Fuel Transfer Pump and Fuel Filter
- Group 15 — Roto Diesel Fuel Injection Pump
- Group 20 — Fuel Injection Nozzles
- Group 25 — Ether Starting Aid
- Group 30 — Speed Control Linkage
- Group 35 — Air Intake System

SECTION 40 — ELECTRICAL SYSTEM

- Group 00 — Specifications and Special Tools
- Group 05 — Description and Diagnosing Malfunctions
- Group 10 — Wiring Harnesses
- Group 15 — Controls and Instruments
- Group 20 — Lighting Systems
- Group 25 — Wiring Diagram
- Group 30 — Starting Motor
- Group 35 — Alternator

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CONTENTS — Continued

SECTION 50 — POWER TRAIN

- Group 00 — Specifications and Special Tools
- Group 05 — Engine Clutches and Clutch Linkages
- Group 10 — Hi-Lo Shift Unit
- Group 15 — Reverser Transmission
- Group 20 — Synchronized Transmission and Transmission Oil Pump
- Group 25 — Collar Shift Transmission and Transmission Oil Pump
- Group 30 — Differential
- Group 35 — Final Drives
- Group 40 — Independent PTO Shaft
- Group 45 — Continuous-Running PTO
- Group 50 — Mechanical Front Wheel Drive

SECTION 60 — STEERING SYSTEM AND BRAKES

- Group 00 — Specifications and Special Tools
- Group 05 — Power Steering
- Group 10 — Brakes

SECTION 70 — HYDRAULIC SYSTEM

- Group 00 — Specifications and Special Tools
- Group 05 — Hydraulic System Operation
- Group 06 — Hydraulic System Tests
- Group 10 — Oil Reservoir, Filter, Valves and Oil Cooler
- Group 15 — Hydraulic Pump
- Group 20 — Rockshaft
- Group 25 — Selective Control Valves and Breakaway Coupler
- Group 30 — Remote Cylinder

SECTION 80 — MISCELLANEOUS

- Group 00 — Specifications
- Group 05 — Front Axle
- Group 10 — Belt Pulley
- Group 15 — Front and Rear Wheels
- Group 20 — ROLL-GARD® Protective Structure
- Group 25 — Operator's Station

Section 10

GENERAL

CONTENTS OF THIS SECTION

	Page		Page
GROUP 00 — SPECIFICATIONS AND SPECIAL TOOLS		GROUP 05 — PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS	
Specifications	10-00-3	Tractor Storage	10-05-1
Serial Numbers	10-00-3	Predelivery Inspection	10-05-2
Model Numbers	10-00-3	Delivery Inspection	10-05-8
Engine	10-00-3	After-Sales Inspection	10-05-8
Engine Clutch	10-00-4		
Cooling System	10-00-4	GROUP 10 — LUBRICATION AND SERVICE	
Fuel System	10-00-4	Lubrication and Service	10-10-1
Electrical System	10-00-5		
Synchronized Transmission	10-00-5	GROUP 15 — TUNE-UP	
Collar Shift Transmission	10-00-5	Preliminary Engine Testing	10-15-1
Hi-Lo Shift Unit	10-00-5	Dynamometer Test	10-15-1
Reverser Transmission	10-00-5	Testing Compression Pressure	10-15-2
Differential and Final Drives	10-00-6	Tune-up	10-15-3
Differential Lock	10-00-6	Checking Tractor Operation	10-15-8
PTO	10-00-6	Standard Torques	10-15-9
Mechanical Front Wheel Drive	10-00-7		
Power Steering	10-00-7	GROUP 20 — TRACTOR SEPARATION	
Foot Brakes	10-00-7	Separating Between Engine and	
Handbrake	10-00-7	Tractor Front End	10-20-1
Hydraulic System	10-00-7	Removal and Installation of	
Capacities	10-00-7	Engine	10-20-5
Travel Speeds	10-00-8	Removal and Installation of	
Front and Rear Wheels	10-00-8	Clutch Housing	10-20-7
Dimensions and Weights	10-00-8	Removal and Installation of	
Predelivery, Delivery and		Final Drives	10-20-9
After-Sales Inspections	10-00-10	Removal and Installation of	
Lubrication and Service	10-00-11	Rockshaft	10-20-10
Tune-up	10-00-12		
Tractor Separation	10-00-13		
Standard Torques	10-00-14		
Special Tools	10-00-16		

Group 00

SPECIFICATIONS AND SPECIAL TOOLS

SPECIFICATIONS

Serial Numbers

The engine serial number is stamped into the plate located on the lower front right-hand side of the cylinder block.

NOTE: When ordering engine parts, quote all digits of serial number stamped on the plate.

The plate showing the tractor serial number is located on the right-hand side of the front axle carrier.

NOTE: When ordering tractor spare parts (excluding engine parts), quote all digits of serial number stamped on the plate.

A plate showing the tractor type, transmission serial number, (and cone point measurement etched into pinion face of differential drive shaft as well as reduction of differential) is located on the right-hand side of the transmission case.

Model Numbers

The fuel injection pump, fuel injection nozzles, alternator, starting motor, and hydraulic pump have model numbers for positive identification.

Engine

Number of cylinders	3
Cylinder liner bore	106.5 mm (4.19 in.)
Stroke	110 mm (4.33 in.)
Displacement	2940 cm ³ (179 cu.in.)
Compression ratio	16.8 : 1
Maximum torque	
2040 at 1400 rpm	152 N•m 112 ft-lbs
2240 at 1400 rpm	185 N•m 136 ft-lbs
Firing order	1-2-3
Valve clearance (engine hot or cold)	
Intake valve	0.35 mm 0.014 in.
Exhaust valve	0.45 mm 0.018 in.

Electrical System

Batteries 1 or 2 x 12 volts, 55 ampere-hours
Alternator with internal regulator 14 volts, 33 or 55 amps
Starting motor 12 volts, 3 KW (4 hp)
Battery terminal grounded..... negative

Synchronized Transmission

Type Synchronized transmission
Gear selections..... 8 forward and 4 reverse
Gear shifting.....Two forward groups and one reverse group.
Synchronized forward and reverse shifting
within groups.

Collar Shift Transmission

TypeHelical gears
Gear selections..... 8 forward, 4 reverse speeds
Gear shifting.....Two forward ranges, One reverse range

Hi-Lo Shift Unit

Type Hydraulic gear reduction unit which can be
shifted under load with "wet" multiple
disk clutch and brake packs
Travel speed decreases in each gear by.....Approx. 20 percent
Shifting to reduced (Lo) speed.....Preloaded cup springs
Shifting to normal (Hi) speed.....Hydraulic

Reverser

Type Hydraulically controlled can be
shifted under load, with "wet" disk
clutches and brakes, planetary reverser unit
Gear selections..... 1 to 4
Increase in reverse gear speeds.....Approx. 16 percent

Differential and Final Drives

Type of differential Spiral bevel gears

Type of final drive Planetary reduction drive

Differential Lock

Operation Hand or foot-operated

Disengage Will disengage automatically as soon as traction has equalized

PTO Shafts

INDEPENDENT PTO — 540 RPM

Type Independent of transmission, can be engaged and disengaged under load

PTO clutch Hydraulically operated “wet” disk clutch

PTO brake Hydraulically operated “wet” disk brake

CONTINUOUS — RUNNING PTO — 540 RPM

Type Independent of transmission, with engine dual-stage clutch

PTO SPEEDS (IN RPM) — WITHOUT REVERSER

Engine speed	540 rpm shaft
800	180
2400	540
2500	565
2660	600

PTO SPEEDS (IN RPM) — WITH REVERSER

Engine speed	540 rpm shaft
800	210
2075	540
2400	625
2500	650
2660	690

Mechanical Front Wheel Drive

Type Engaged hydraulically, under full load with
"wet" disk clutch

Control..... Electrical/hydraulic solenoid switch

EngagementPreloaded cup springs

DisengagementHydraulic

Power Steering Hydraulically operated steering linkage

Foot BrakesSelf-adjusting, hydraulically operated "wet" disk brakes

Handbrake Mechanically-operated band-type locking brake
acting on the differential

Hydraulic System

Type Closed center, constant pressure system

Standby pressure 15500 kPa 155 bar 2250 psi

Operating pressure 14000 kPa 140 bar 2050 psi

Hydraulic pump..... 8-piston pump with variable displacement

Capacities

Fuel tank..... 78 L 20.6 U.S. gal.

Cooling system..... 70.5 L 2.80 U.S. gal.

Engine crankcase

Without filter change..... 6.5 L 1.7 U.S. gal.

With filter change..... 7 L 1.8 U.S. gal.

Capacities — Continued

Transmission — Hydraulic system (including oil reservoir and oil cooler)

Synchronized transmission

Initial filling	63 L	16.65 U.S. gal.
Oil change	55 L	14.5 U.S. gal.

Collar shift transmission (without reverser)

Initial filling	47 L	12.4 U.S. gal.
Oil change	39 L	10.3 U.S. gal.

Collar shift transmission (with reverser)

Initial filling	42 L	11.1 U.S. gal.
Oil change	34 L	9 U.S. gal.

Oil reservoir 4 L 1.1 U.S. gal.

Oil cooler 2 L 0.5 U.S.

Mechanical front wheel drive

Front axle housing	5.3 L	1.4 U.S. gal.
Final drive housing, each	0.75 L	0.2 U.S. gal.
Belt pulley	1 L	0.3 U.S. gal.

Travel Speeds see Operator's Manual

Front and Rear Wheels

Tires, tread widths, tire pressures and ballast weights see Operator's Manual

Dimensions and Weights see Operator's Manual

PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS

Engine Speeds

Slow idle.....	800 rpm
Fast idle	2660 rpm
Rated speed.....	2500 rpm

Fan Belt

The fan belt should have 19 mm (0.75 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

Clutch Pedal

Clutch pedal free travel approx. 25 mm (1 in.)

Front Wheel Toe-In

Tractors without MFWD.....	3 to 6 mm	(0.12 to 0.25 in.)
Tractors with MFWD.....	0 to 3 mm	(0 to 0.12 in.)

Torques for Hardware

Start safety switch in rockshaft housing, max.	50 N•m	(35 ft-lbs)
Front wheel rim to hub		
Tractors without MFWD.....	180 N•m	(130 ft-lbs)
Tractors with MFWD.....	300 N•m	(220 ft-lbs)
Axle knees to axle center, cap screws	400 N•m	300 ft-lbs)
Outer tie rod clamp, cap screw	110 N•m	(80 ft-lbs)
Inner tie rod clamp, cap screw	40 N•m	(30 ft-lbs)
Rear wheels		
Tractors with steel wheel disks		
Rear wheels to rear axle	240 N•m	(175 ft-lbs)
Tractors with cast wheel disks		
Rear wheels to rear axle	400 N•m	(300 ft-lbs)
Tractors with rack-and-pinion axle		
Wheel disk to hub.....	400 N•m	(300 ft-lbs)
2-post ROLL-GARD®		
Supports to crossbar, cap screws.....	230 N•m	(170 ft-lbs)
U-bolt hex. nuts	230 N•m	(170 ft-lbs)

LUBRICATION AND SERVICE

Capacities

Engine crankcase

Without filter change.....	6.5 L (1.70 U.S. gal.)
With filter change.....	7.0 L (1.80 U.S. gal.)

Transmission-Hydraulic system (including oil reservoir and oil cooler)

Synchronized transmission

Initial filling	63.0 L (16.65 U.S. gal.)
Oil change	55.0 L (14.50 U.S. gal.)

Collar shift transmission (without reverser)

Initial filling	47.0 L (12.40 U.S. gal.)
Oil change	39.0 L (10.30 U.S. gal.)

Collar shift transmission (with reverser)

Initial filling	42.0 L (11.10 U.S. gal.)
Oil change	34.0 L (9.00 U.S. gal.)

Mechanical front wheel drive

Front axle housing	5.3 L (1.40 U.S. gal.)
Final drive housing, each.....	0.75 L (0.20 U.S. gal.)

Belt pulley.....	1 L (0.3 U.S. gal.)
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Service Intervals

Checking crankcase oil level	every 10 hours
Changing engine oil	every 100 hours
Changing engine oil filter.....	every 200 hours
Checking transmission/hydraulic system oil level.....	every 50 hours
Changing transmission/hydraulic system oil filter	every 500 hours
Changing transmission/hydraulic oil	every 1000 hours
Cleaning hydraulic pump strainer	every 1000 hours
Checking MFWD oil level	every 50 hours
MFWD oil change.....	every 1000 hours
Cleaning and packing front wheel bearings	every 1000 hours
Lubricating grease fittings	
Front axle and front axle bearings	every 10 hours
Rear axle bearings	every 500 hours
in wet and muddy conditions.....	every 10 hours
Three-point hitch.....	every 200 hours

TUNE-UP

PTO horsepower* at 2500 rpm rated engine speed

2040.....	30 kW	(40 hp)
2240.....	37 kW	(50 hp)

Compression 2100 kPa 21 bar 300 psi

Slow idle 800 rpm

Fast idle 2660 rpm

Rated engine speed 2500 rpm

Air intake system vacuum 3.5 to 6.0 kPa 35 to 60 mbar (14 to 25 in. water head)

Air cleaner restriction warning
switch closes at a vacuum of 5.5 to 6.5 kPa 55 to 65 mbar (22 to 26 in. water head)

Blow-by at crankcase vent tube, max.

2040.....	1.9 m ³ /h	(67 cu.ft./h)
2240.....	2.1 m ³ /h	(74 cu.ft./h)

Thermostat opens at 82° C (180° F)

Radiator cap high pressure valve
opens at 40 to 50 kPa 0.4 to 0.5 bar (6 to 7 psi)

Radiator cap low pressure valve
opens at 0 to 4 kPa 0 to 0.04 bar (0 to 0.6 psi)

Fan belt should have 19 mm (0.75 in.) flex with 90 N (20 lbs) pull midway between crankshaft and alternator or water pump (use a spring scale).

**With the engine run in (more than 100 hours of operation) and having reached operating temperature (engine and transmission); measured by means of a dynamometer. Permissible variation ± 5%.*





TRACTOR SEPARATION

Torques for Hardware

Front axle carrier to engine		
front attaching cap screws (4 used)	230 N•m	(170 ft-lbs)
rear attaching cap screws (2 used)	180 N•m	(130 ft-lbs)
Hydraulic pump drive shaft, cap screws	50 N•m	(35 ft-lbs)
Jointed shaft flange to front axle		
drive hub (tractors with MFWD), cap screws	35 N•m	(25 ft-lbs)
Drag link to bell crank or steering arm, slotted nuts*	75 N•m	(55 ft-lbs)
Clutch housing to engine block, cap screws	230 N•m	(170 ft-lbs)
Clutch housing to transmission case, cap screws	160 N•m	(120 ft-lbs)
Hydraulic lines retainer to clutch housing, cap screw	45 N•m	(32 ft-lbs)
Final drive housings to transmission case, cap screws	120 N•m	(85 ft-lbs)
Rear wheels		
Tractors with steel wheel disks		
Rear wheels to rear axle	240 N•m	(175 ft-lbs)
Tractors with cast wheel disks		
Rear wheels to rear axle	400 N•m	(300 ft-lbs)
Tractors with rack-and-pinion axle		
Wheel disk to hub	400 N•m	(300 ft-lbs)
2-post ROLL-GARD®		
Supports to crossbar, cap screws	230 N•m	(170 ft-lbs)
U-bolt hex. nuts	230 N•m	(170 ft-lbs)
Drawbar to transmission case, cap screws	120 N•m	(85 ft-lbs)
Basic weight to front axle carrier, cap screws	400 N•m	(300 ft-lbs)

*NOTE: If cotter pin cannot be inserted when tightening to the specified torque, turn nut to next slot and secure with cotter pin.

STANDARD TORQUES

RECOMMENDED TORQUES IN N•m AND FT-LBS FOR UNC AND UNF CAP SCREWS				
Head marking (Identifying strength)	  or 10.9*		  or 12.9**	
Thread—O.D. (in.)	N•m	ft-lbs	N•m	ft-lbs
1/4	15	10	20	15
5/16	30	20	40	30
3/8	50	35	70	50
7/16	80	55	110	80
1/2	120	85	170	120
9/16	180	130	240	175
5/8	230	170	320	240
3/4	400	300	580	425
7/8	600	445	930	685
1	910	670	1400	1030
1-1/8	1240	910	1980	1460
1-1/4	1700	1250	2800	2060

NOTE: A variation of ± 10% is permissible for all torques indicated in this chart.

Torque figures indicated above and in the Specification sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

**Tempered steel high-strength bolts and cap screws*

***Tempered steel extra high-strength bolts and cap screws*

RECOMMENDED TORQUES IN N•m AND FT-LBS FOR METRIC CAP SCREWS						
Head marking (Identifying strength)	8.8*		10.9**		12.9***	
	N•m	ft-lbs	N•m	ft-lbs	N•m	ft-lbs
M5	7	5	9	6.5	10	8.5
M6	10	8.5	15	10	20	15
M8	30	20	40	30	40	30
M10	50	35	80	60	90	70
M12	100	75	140	100	160	120
M14	160	120	210	155	260	190
M16	240	175	350	260	400	300
M20	480	355	650	480	780	575
M24	820	605	1150	850	1350	995
M30	1640	1210	2250	1660	2700	1990
M36	2850	2110	4000	2950	4700	3465

NOTE: A variation of $\pm 10\%$ is permissible for all torques indicated in this chart.

Torque figures indicated above and in the Specification sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

*Regular bolts and cap screws

**Tempered steel high strength bolts and cap screws

***Tempered steel extra high strength bolts and cap screws

RECOMMENDED TORQUES IN N•m and FT-LBS FOR PIPE AND HOSE CONNECTIONS				
Thread size	with O-rings		with cone	
	N•m	ft-lbs	N•m	ft-lbs
3/8-24 UNF	7.5	5.5	8	6
7/16-20 UNF	10	7	12	9
1/2-20 UNF	12	9	15	11
9/16-18 UNF	15	11	25	18
3/4-16 UNF	25	20	45	35
7/8-14 UNF	40	30	60	45
1-1/16-12 UNC	60	45	100	75
1-3/16-12 UNC	70	50	120	90
1-5/16-12 UNC	80	60	140	105
1-5/8-12 UNC	110	80	190	140
1-7/8-12 UNC	150	110	220	160