

# 2240 Tractor (S/N-349999L)



## TECHNICAL MANUAL

2240 Tractor  
(S/N-349999L)

TM4301 (01Aug75) English

John Deere Tractor Works  
TM4301 (01Aug75)

LITHO IN U.S.A.  
ENGLISH



# Tractor 2240

Technical Manual  
TM-4301 (Aug-75)

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**GENERAL 10**

**ENGINE 20**

**FUEL SYSTEM 30**

**ELECTRICAL SYSTEM 40**

**POWER TRAIN 50**

**STEERING AND BRAKES 60**

**HYDRAULIC SYSTEM 70**

**MISCELLANEOUS 80**

## INTRODUCTION



L 52046

### *Use FOS Manuals for Reference*

This technical manual is part of a twin concept of service:

- FOS Manuals — for reference
- Technical Manuals — for actual service

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

*Fundamentals of Service (FOS) Manuals cover basic theory of operation, fundamentals of trouble shooting, general maintenance, and basic types of failures and their causes. FOS Manuals are for training new personnel and for reference by the experienced technician.*

*Technical Manuals are concise service guides for a specific machine. Technical Manuals are on-the-job guides containing only the vital information needed by an experienced technician.*



When any serviceman should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.



L 52047

### *Use Technical Manuals for Actual Service*

Some features of this technical manual:

- *Table of contents at front of whole Manual*
- *Contents at front of each Section*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications at end of each Group*
- *Special tools at end of each Group*

This technical manual was planned and written for you — an experienced technician. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.



This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

# Section 10 GENERAL

## CONTENTS OF THIS SECTION

### GROUP 5 — SPECIFICATIONS

	Page
Serial numbers . . . . .	5-2
Model numbers . . . . .	5-2
Engine . . . . .	5-2
Engine clutch . . . . .	5-2
Electrical system . . . . .	5-2
Transmission . . . . .	5-3
Hi-Lo shift unit . . . . .	5-3
Differential and final drives . . . . .	5-3
Differential lock . . . . .	5-3
PTO . . . . .	5-3
Hydraulic system . . . . .	5-3
Power steering . . . . .	5-3
Manual steering . . . . .	5-3
Hydraulic brakes . . . . .	5-3
Capacities . . . . .	5-3
Travel speeds . . . . .	5-3
Front and rear wheels . . . . .	5-3
Dimensions and weights . . . . .	5-3

### GROUP 10 — PREDELIVERY, DELIVERY AND AFTER-SALES INSPEC- TIONS

Predelivery inspection . . . . .	10-1
Delivery inspection . . . . .	10-4
After-sales inspection . . . . .	10-4

### GROUP 15 — LUBRICATION AND PERIODIC SERVICE

	Page
Lubrication and periodic service . . . . .	15-1

### GROUP 20 — ENGINE AND TRACTOR TUNE-UP

General information . . . . .	20-1
Preliminary engine testing . . . . .	20-1
Engine tune-up . . . . .	20-2
Checking engine performance . . . . .	20-3
Tractor tune up . . . . .	20-3
Standard torques . . . . .	20-5

### GROUP 25 — TRACTOR SEPARATION

Separating between engine and tractor front end . . . . .	25-1
Removing and installing engine . . . . .	25-3
Removal and installation of clutch housing . . . . .	25-5
Removal and installation of final drives . . . . .	25-7
Removal and installation of rockshaft . . . . .	25-8
Torques for hardware . . . . .	25-9
Special tools . . . . .	25-10

# Group 5 SPECIFICATIONS

## SERIAL NUMBERS

The engine serial number is stamped into the name plate at the lower right of the cylinder block.

*NOTE: If ordering engine parts, indicate all digits of the serial number on the name plate.*

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

*NOTE: If ordering tractor parts, (excluding engine parts), indicate all digits of the serial number on the name plate.*

## MODEL NUMBERS

The injection pump, injection nozzles, the alternator, starting motor and the hydraulic pump have model numbers to facilitate identification of different makes of a given unit.

## SPECIFICATIONS

### ENGINE

Number of cylinders	3
Cylinder liner bore	106.5 mm (4.19 in.)
Stroke	110 mm (4.33 in.)
Displacement	2940 cm <sup>3</sup> (179 cu.in.)
Compression ratio	
(-271533CD)	16.2 : 1
(271534CD-)	16.8 : 1
Maximum torque at 1300 rpm	188 Nm (138 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.)

Fast idle	2650 rpm
Slow idle	650 rpm
Working speed range	1500 to 2500 rpm
PTO power* (at 2500 rpm engine speed and 650 rpm powershaft speed)	37 kW (50 HP)

### ENGINE CLUTCH

Dual-stage dry disk clutch, foot-operated (on tractors with continuous running PTO)

Single-stage dry disk clutch with torsion damper (isolator), foot-operated (on tractors with independent PTO)

### ELECTRICAL SYSTEM

Batteries	2 x 12 volts, 55 ampere-hours
or	1 x 12 volts, 55 ampere-hours
Starting motor	12 volts, 3 kW (4 HP)
Alternator	14 volts, 28 amps.
Battery terminal grounded	negative

\* 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 %.

TRANSMISSION

Type . . . . . Collar shift

Gear selections . . . . . 8 forward and 4 reverse

Shifting . . . . . 4 speeds each in high, low, and reverse ranges. Park lock included.

HI-LO SHIFT UNIT

Hydraulically controlled reduction gear which can be shifted under load, with "wet" multiple disk clutch and "wet" multiple disk brake. Allows reduction of the individual gear speeds by 21 %.

DIFFERENTIAL AND FINAL DRIVES

Planetary reduction gear and differential with spiral bevel gears.

DIFFERENTIAL LOCK

Hand or foot operated; spring-loaded out of engagement.

PTO

Type . . . . . Rear 540 rpm continuous-running or independent

Power Shaft Speeds

Engine Speed in rpm	PTO shaft speed in rpm
650	169
2067	538
2075	540
2500	650
2650	689

HYDRAULIC SYSTEM

Closed center, constant pressure system; also includes rockshaft, power steering and selective control valves.

Stand by oil pressure . . . . . 15 304 to 15 718 kPa  
 (153 to 157 bar)  
 (2220 to 2280 psi)

Pump . . . . . 8-piston pump driven by the engine

POWER STEERING

The steering system is a "closed center" type incorporated by the hydraulic system and supplied with oil by the hydraulic pump. It is connected to the front wheels by means of a steering linkage.

MANUAL STEERING

The manual steering is a recirculating ball bearing, worm and nut type. A number of steel balls between ball nut and steering wheel shaft provide for positive engagement of steering wheel and steering linkage.

HYDRAULIC BRAKES

The disk brakes run in an oil bath and are hydraulically controlled.

CAPACITIES

	Ltr.	US.gals.
Fuel tank . . . . .	62.5	16.5
Cooling system . . . . .	10.0	2.6
Engine crankcase incl. filter . . . . .	7.0	1.8
Transmission-hydraulic system		
Dry system . . . . .	36.0	9.5
At service intervals . . . . .	28.0	7.4
Belt pulley . . . . .	1	0.3

TRAVEL SPEEDS

See Operator's Manual

FRONT AND REAR WHEELS

For tire sizes, treads, inflation pressure and weights see Operator's Manual.

DIMENSIONS AND WEIGHTS

See Operator's Manual.



**Group 10**

# PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS

## PREDELIVERY INSPECTION

To promote complete customer satisfaction, proper predelivery service including mending of possible shipping damage and giving the finishing touches to the tractor, are of prime importance to the dealer.

A tag pointing out the factory-recommended procedure for predelivery service is attached to

every new tractor before it leaves the factory. The reverse side of this tag is filled in by the factory after the tractor has undergone a thorough inspection prior to shipping.

After completing the factory-recommended dealer checks and services listed on the predelivery tag, remove the tag from the tractor and file it with the shop order for the job. The tag will then serve as a basis for certifying that the unit has received the proper predelivery service.

### Temporary Tractor Storage

Service	Specifications	Reference
Check radiator for coolant loss and antifreeze protection (gravity of anti-freeze and rust inhibitor mixture)	Coolant level should be mid-way between radiator core and bottom edge of filler neck	Operator's manual
If the tractor is to be operated for a short time without battery (using a slave battery for starting), do not, under any circumstances, interrupt the circuit by switching off the key switch before stopping the engine by means of fuel pump shut off cable. Use additional current (lights) whilst engine is running. Insulate terminal of battery cable before starting by means of slave battery. If this advice is disregarded, damage to alternator and regulator may result.	.....	Section 40, group 10
Remove batteries. Drain electrolyte and store batteries	Store at room temperature	.....
Reduce shipping pressure of tires	.....	Operator's manual
Cover tractor and tires for protection and cleanliness	.....	.....



PREDELIVERY INSPECTION (Contd.)

Service	Specifications	Reference
<b>COOLING SYSTEM</b>		
Check radiator for coolant loss	Coolant level should be midway between radiator core and bottom edge of filler neck.	Operator's manual
Check gravity of antifreeze and rust inhibitor mixture	.....	Operator's manual
<b>ELECTRICAL SYSTEM</b>		
If the tractor is to be operated for a short time without battery (using a slave battery for starting), do not, under any circumstances, interrupt the circuit by switching off the key switch before stopping the engine by means of fuel pump shut off cable. Use additional current (lights) whilst engine is running. Insulate terminal of battery cable before starting the engine by means of slave battery.	.....	Section 40, group 10
If this advice is disregarded, damage to alternator and regulator may result.	.....	Section 40, group 10
If the batteries are to be installed, connect them in the proper polarity (negative to ground). If they are improperly connected, the rectifier diodes will be immediately destroyed.	.....	Section 40, group 10
First connect positive (+) cable and then ground (-) strap of each battery. Only then start tractor engine.	.....	Section 40, group 10

**PREDELIVERY INSPECTION (Contd.)**

Service	Specification	Reference
<b>TIRES AND WHEELS</b>		
Check tire inflation pressure	.....	Operator's manual
Retighten wheel bolts	.....	Section 80, group 15 and Operator's manual
<b>LUBRICATION</b>		
Check crankcase oil level	Top mark on dip stick	Operator's manual
Check transmission-hydraulic system oil level	.....	Operator's manual
Lubricate all lubrication points on the tractor	.....	Operator's manual
<b>ENGINE</b>		
Check air cleaner	.....	Operator's manual
Fill fuel tank and start engine	Capacity: 62.5 liters (16.5 U.S. gals.)	Operator's manual
Check lighting system, indicator lights and instruments for proper operation	.....	Operator's manual
Check if speed control linkage moves easily	.....	Section 20, group 40
Check engine idle speeds	.....	Section 20, group 40
Check injection timing	.....	Section 30, group 15
<b>OPERATION</b>		
Check clutch pedal adjustment	Approx. 25 mm (1 in.) clutch pedal free travel	Section 50, group 5
Check operation of Hi-lo shift unit	.....	Section 50, group 10
Shift transmission through all speeds	.....	Operator's manual
Check differential lock operation	.....	Operator's manual
<b>Check PTO operation</b>	.....	Operator's manual
Check 3-point hitch operation	.....	Operator's manual
Check hydraulic system operation	.....	Section 70, group 5
Check brake system	.....	Section 60, group 15

**PREDELIVERY INSPECTION (Contd.)**

Service	Specifications	Reference
Check steering operation	.....	Section 60, group 10
Check seat operation	.....	Operator's manual
Check operation of remote hydraulic cylinder (if equipped)	.....	Section 70, group 5
<b>GENERAL</b>		
Tighten accessible nuts and attaching screws	.....	Section 10, group 20
Attach roll guard (if equipped)	Tighten cap screws cross-wise 1. Step = 70 Nm (50 ft.lbs.) 2. Step = 400 Nm (300 ft.lbs.)	.....
Clean tractor and touch up paint	.....	.....

**DELIVERY INSPECTION**

A thorough discussion of the operation and service of the tractor at the time of its delivery helps to assure complete customer satisfaction.

Proper delivery should be an important phase of the dealer's program.

It is a well-known fact that many complaints have arisen simply because the owner was not shown how to operate and service his new tractor properly. Therefore, enough time should be devoted, at the customer's convenience, to introducing him to his new tractor and explaining to him how to operate and service it.

Using the tractor operator's manual as a guide, be sure that the owner understands the following points properly.

1. Adjusting the seat
2. Operation of control levers and instruments
3. Starting and shutting off the engine
4. The importance of the tractor break-in period
5. Use of weights and proper inflation pressure as well as filling of tires with water and calcium chloride, if required.
6. Operating the complete hydraulic system
7. Operating the power shaft and belt pulley (if equipped)
8. The importance of the safety rules
9. The importance of lubrication and periodic service

**AFTER-SALES INSPECTION**

In the interest of the purchaser and the dealer an after-sales inspection should be carried out by the dealer after the first 100 hours of using a new John Deere tractor.

The purpose of this inspection is to make sure that the customer is receiving satisfactory performance from his tractor. At the same time, the inspection should reveal whether or not the tractor is being operated, lubricated and serviced properly.

Through this inspection a needless volume of service work can be eliminated by preventing

minor difficulties from developing into serious problems later on. It also will promote stronger dealer-customer relations and give the customer an opportunity to ask questions that may have arisen during the first few days of use.

Thereby the dealer has the further opportunity of promoting the possible sale of other new equipment.

The following inspection program is recommended:

**AFTER-SALES INSPECTION**

Service	Specifications	Reference
<b>COOLING SYSTEM</b>		
Check coolant level	Coolant level should be midway between radiator core and bottom edge of filler neck	Operator's manual
Clean exterior of radiator	.....	.....
Check hose connections	.....	.....
<b>FUEL SYSTEM</b>		
Check fuel filter for water or sediment and clean transfer pump screen	.....	Operator's manual
Check line connections	.....	.....
<b>ELECTRICAL SYSTEM</b>		
Check gravity of battery electrolyte	Gravity should be 1.260 at an electrolyte temperature of 27°C (80°F)	
Check electrolyte level of batteries	To bottom of filler neck in each cell	Operator's manual
Check tension of fan belt	19 mm (3/4 in.) deflection with a 90 N (20lbs.) force	Operator's manual and section 20, group 35
Start engine and check operation of lights, indicator lamps and instruments	.....	Operator's manual
<b>LUBRICATION</b>		
Check crankcase oil level	Top mark on dip stick	Operator's manual
Check transmission oil level	.....	Operator's manual
Check oil level of manual steering gear housing	Add oil up to filler hole	Operator's manual
Check oil level of belt pulley housing	Add oil up to filler hole	Operator's manual
Lubricate clutch throw-out bearing	.....	Operator's manual
Lubricate 3-point hitch	.....	Operator's manual

**AFTER-SALES INSPECTION**

Service	Specifications	Reference
<b>ENGINE</b>		
Check air cleaner	.....	Operator's manual
Check valve clearance	Intake valve: 0.35 mm (0.014 in.) Exhaust valve: 0.45 mm (0.018 in.)	Section 20, group 10
Re-tighten cylinder head cap screws	130 Nm (95 ft.lbs.) (dip in oil)	Section 20, group 10
Check engine speed under load as well as fast and slow idle speed	.....	Section 20, group 40
Check engine performance	.....	Section 10, group 20
<b>GENERAL</b>		
Check clutch pedal adjustment	Approx. 25 mm (1 in.) free travel	Section 50, group 5
Check operation of Hi-lo shift unit	.....	Section 50, group 10
Shift transmission through all speeds	.....	Operator's manual
Check operation of PTO	.....	Operator's manual
Check differential lock	.....	Operator's manual
Check operation of hydraulic system	.....	Section 70, group 5
Check steering system	.....	Section 60, group 10
Check brakes	.....	Section 60, group 15
Tighten accessible nuts and cap screws	.....	Section 10, group 20
Tighten roll guard attaching screws and nuts	400 Nm (300 ft.lbs.)	.....
Tighten accessible hydraulic lines	.....	.....
Visual inspection of tractor	Damaged paint, loose connections, proper posi- tioning of hoses and lines, leaks, operation of all me- chanical parts	.....

**Group 15**  
**LUBRICATION AND PERIODIC SERVICE**

For brands of oil and lubricants to be used as well as for lubricating and servicing the tractor 2240, see operator's manual.





**Group 20**

# ENGINE AND TRACTOR TUNE-UP

## GENERAL INFORMATION

Before tuning up the engine, determine whether a tune-up will restore operating efficiency. If there is doubt, the following preliminary tests will help to determine if the engine can be tuned up.

## PRELIMINARY ENGINE TESTING

Service	Specifications	Reference
Checking air intake system by means of vacuum gauge	355 to 635 mm (14 to 25 in.) water head; engine running at fast idle speed	 "Fundamentals of Service, Engine" manual under "Diagnosis and Testing"
Check radiator for air bubbles or oil film	.....	.....
Check compression (min. reading)	2 068 kPa (21 bar) (300 psi)	 "Fundamentals of Service, Engine" manual under "Diagnosis and Testing"
Measure engine horsepower at powershaft (using a dynamometer)	Record measured performance and compare with performance measured after carrying out "Engine Tune-up"	.....