

4430 Tractor

TECHNICAL MANUAL
4430
Tractor

4430 TRACTOR

Serial No. (-33109)

TECHNICAL MANUAL

CONTENTS

SECTION 10—GENERAL

- Group 5—General Tractor Specifications
- Group 10—Predelivery, Delivery, and After-Sale Services
- Group 15—Tune-Up
- Group 20—Lubrication
- Group 25—Separation
- Group 30—Specifications and Special Tools

SECTION 20—ENGINE

- Group 5—General Information and Diagnosis
- Group 10—Cylinder Head, Valve Train, and Camshaft
- Group 15—Cylinder Block, Liners, Pistons, and Rods
- Group 20—Crankshaft, Main Bearings, and Fly-wheel
- Group 25—Lubricating System
- Group 30—Cooling System
- Group 35—Specifications and Special Tools

SECTION 30—FUEL SYSTEM

- Group 5—Diagnosing Malfunctions
- Group 10—Air Intake System
- Group 15—Diesel Fuel System
- Group 20—Speed Control Linkage
- Group 25—Specifications and Special Tools

SECTION 40—ELECTRICAL SYSTEM

- Group 5—Information and Wiring Diagrams
- Group 10—Delcotron Charging Circuit
- Group 15—Delco-Remy Starting Circuit
- Group 20—John Deere Starting Circuit
- Group 25—Lighting and Accessory Circuits
- Group 30—Specifications and Special Tools

SECTION 50—POWER TRAIN

- Group 5—Perma-Clutch
- Group 10—Creeper Transmission
- Group 15—Syncro-Range Transmission
- Group 20—Quad-Range Transmission
- Group 25—Power Shift Transmission
- Group 30—Differential
- Group 35—Final Drive
- Group 40—Hi-Crop Final Drive
- Group 45—PTO, Perma-Clutch
- Group 50—PTO, Power Shift
- Group 55—Power Front-Wheel Drive
- Group 60—Specifications and Special Tools

SECTION 60—STEERING AND BRAKES

- Group 5—General Information

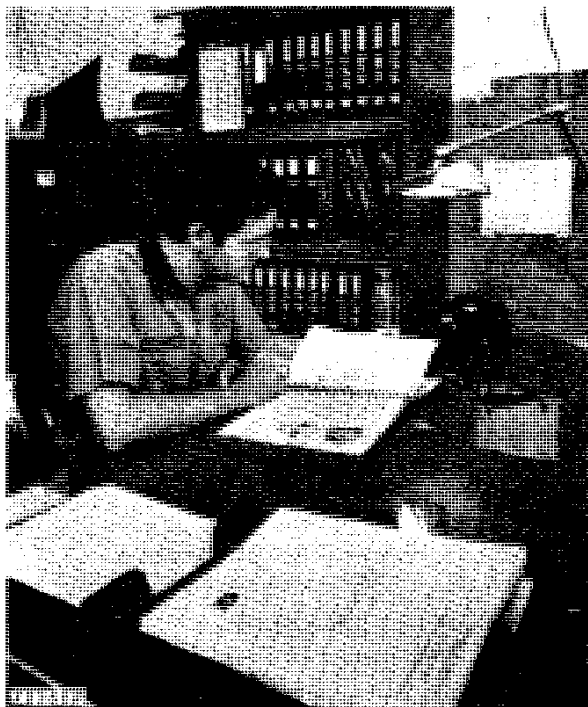
SECTION 70—HYDRAULIC SYSTEM

- Group 5—General Information
- Group 6—General Hydraulic System Diagnosis and Tests
- Group 10—Main Reservoir, Filters, Valves, and Oil Cooler
- Group 15—Hydraulic Pumps
- Group 20—Early Model Power Steering
- Group 22—Late Model Power Steering
- Group 25—Power Brakes
- Group 30—Selective Control Valve, Breakaway Couplers, and Remote Cylinders
- Group 35—Specifications and Special Tools

SECTION 80—MISCELLANEOUS

- Group 5—Front Axles
- Group 10—Air Conditioning System
- Group 15—Heating System
- Group 20—Specifications and Special Tools

INTRODUCTION



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 men and for reference by experienced men.

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



When a 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.



Use Technical Manuals for Actual Service

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

This technical manual was planned and written for you—a journeyman mechanic. 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 identifies 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

	Page		Page
GROUP 5—SPECIFICATIONS		GROUP 20—LUBRICATION	
General Tractor Specifications	5-1	Lubrication Chart	20-1
GROUP 10—PREDELIVERY, DELIVERY, AND AFTER-SALE SERVICES		Engine Lubricating Oils	20-2
Predelivery Services	10-1	Transmission-Hydraulic Oil	20-2
Delivery Services	10-3	Greases	20-2
After-Sale Services	10-4	Storing Lubricants	20-2
GROUP 15—TUNE-UP		GROUP 25—SEPARATION	
Preliminary Engine Testing	15-1	Removing Sound-Gard Body	25-1
Engine Tune-Up	15-1	Installing Sound-Gard Body	25-3
Engine Final Testing	15-2	Separating Engine from Clutch Housing ..	25-3
Tractor Tune-Up	15-3	Removing Engine	25-5
		Separating Tractor Front End from Engine	25-6
		Separating Clutch Housing from	
		Transmission Case	25-7
		Removing Rear Axle Housing	25-9
		GROUP 30—SPECIFICATIONS AND SPECIAL TOOLS	30-1

Group 5 GENERAL TRACTOR SPECIFICATIONS

PTO HORSEPOWER (Official test
at 2200 engine rpm):125.88

ENGINE:

Type6-cylinder, in-line, valve-in-head,
diesel, turbocharged

Bore and stroke 4¼ in. x 4¾ in.

Displacement 404 cu. in.

Compression ratio 15.5 to 1

Firing order 1-5-3-6-2-4

Valve clearance Intake—0.018 in.
Exhaust—0.028 in.

Injection pump timing TDC

Engine Speeds:

Working range1500 to 2200 rpm

Maximum transport speed 2400 rpm

Engine speeds:

Slow idle 800 rpm

Fast idle 2400 rpm

LUBRICATION SYSTEM:

Full pressurized with full-flow micronic oil filter,
water cooled oil cooler, and bypass valves for
filter and cooler.

FUEL SYSTEM:

Type Direct Injection

Filters Two-stage with replaceable
impregnated paper element

Injection pump type Multiple plunger,
in-line

Air cleaner Dry type, with safety element

COOLING SYSTEM:

Type Pressurized with centrifugal pump

Temperature control Heavy-duty
thermostats

CAPACITIES:

Fuel tank 46 U.S. gals.

Cooling system 30 U.S. qts.

Crankcase (with filter change) ... 17 U.S. qts.

Transmission—hydraulic system (add 4½
gals. to capacity if equipped with Power Front
Wheel Drive):

Quad-range or Syncro-range .. 13 U.S. gals.

Power shift transmission 11 U.S. gals.

Hi-crop final drive housing 1¾ U.S. qts.

SYNCRO-RANGE TRANSMISSION:

Type Syncro-range, constant mesh

SYNCRO-RANGE TRANSMISSION (Continued)

Clutch

- Perma-Clutch Hydraulically operated,
wet clutch, multiple disk
- Gear selections 8 forward and 2 reverse
- Shifting 4 stations, synchronized forward
speed shifting within stations

QUAD-RANGE TRANSMISSION:

- Type 2-speed, power shifted, planetary
and 8-speed, syncro-range
transmission with constant mesh gears
- Perma-Clutch Hydraulically operated
multiple disk wet clutch
- Gear selections 16 forward and 6 reverse
- Shifting
 - Range selector lever Collar shifted
between ranges
 - Speed selector lever
 - Forward-rearward lever movement
 - Mechanically synchronized forward
speed shifting of syncro-range
transmission
 - Sideways lever movement Power shift-
ed planetary transmission speeds

POWER SHIFT TRANSMISSION:

- Type Planetary gears, hydraulically
actuated wet disk clutches and brakes
- Gear selections 8 forward and 4 reverse
- Shifting Hydraulic, powershifting con-
trolled by speed selector

POWER TAKE-OFF

- Type Independent PTO with rear
power take-off controlled by hand-
operated clutch lever stub shafts
used for dual speed PTO
speed conversion
- Speed (2200 engine rpm) Dual speed—540
or 1000 rpm; single speed—1000 rpm
- PTO ahead of drawbar
 - hitch point 540 rpm—14 in.
1000 rpm—16 in.

ELECTRICAL SYSTEM

- Type 12-volt, negative grounded
- Batteries:**

- Diesel Two, 6-volt, 5D group, 800
amps cold cranking at 0°F,
376 minutes reserve capacity at 25 amps
- Alternator 12-volt, 55 amp with
Sound-Gard body, 37 amp without
Sound-Gard body

POWER FRONT-WHEEL DRIVE

- Type Hydraulic motor driven with
planetary gear reduction in wheel hub,
uses pressure oil from hydraulic system
- Torque Low (series connected) and
high (parallel connected)
- Controls Solenoid-operated control
valves, synchronized with
transmission controls

HYDRAULIC SYSTEM

- Type Closed center, constant pressure
- Actuates power steering, power brakes,
power front-wheel drive, and
implement control
- Standby pressure 2250 psi

BRAKES

- Type Hydraulically actuated power
disk type operating in oil

STEERING

- Type Hydraulically actuated power,
manual operation in case of
hydraulic failure

FRONT TIRES* 7.50-15, 6-ply rating

REAR TIRES* 20.8-34, 6-ply rating

WHEEL TREADS See tractor
operator's manual

**Additional tire sizes available.*

GROUND SPEEDS (IN MPH, 18.4-38 REAR TIRES)

Gear	SYNCHRO-RANGE AND POWER SHIFT TRANSMISSION			
	Synchro-Range		Power Shift	
	1500 rpm	2200 rpm	1500 rpm	2200 rpm
1st	1.4	2.0	1.2	1.8
2nd	2.2	3.2	1.7	2.5
3rd	2.9	4.2	2.6	3.8
4th	3.7	5.4	3.4	4.9
5th	4.6	6.8	4.4	6.5
6th	6.1	8.9	5.7	8.3
7th	7.8	11.5	7.6	11.2
8th	12.8	18.8	12.9	18.9
1st reverse	2.8	4.1	1.5	2.2
2nd reverse	4.5	6.6	2.1	3.1
3rd reverse	—	—	3.2	4.7
4th reverse	—	—	4.1	6.0

QUAD-RANGE TRANSMISSION

Range	Speed	Forward		Reverse	
		1500 rpm	2200 rpm	1500 rpm	2200 rpm
A	1	1.4	2.0	2.2	3.2
	2	1.8	2.6	2.8	4.1
	3	2.3	3.4	—	—
	4	2.9	4.3	—	—
B	1	3.2	4.7	5.1	7.5
	2	4.0	5.9	6.5	9.5
	3	5.3	7.7	—	—
	4	6.7	9.8	—	—
C	1	3.8	5.5	6.0	8.8
	2	4.8	7.0	7.7	11.2
	3	6.2	9.1	—	—
	4	7.9	11.6	—	—
D	1	5.8	8.5	—	—
	2	7.3	10.8	—	—
	3	9.6	14.0	—	—
	4	12.2	17.8	—	—

DIMENSIONS

	Tractor without Roll-Gard	Tractor with Sound-Gard Body
Wheel base	106 $\frac{5}{8}$ in.	106 $\frac{5}{8}$ in.
Over-all length	160 $\frac{3}{4}$ in.	160 $\frac{3}{4}$ in.
Height to muffler cover	108 $\frac{5}{8}$ in.	125 $\frac{1}{4}$ in.
Height to steering wheel	85 $\frac{1}{4}$	—
Height to top of Sound-Gard Body	—	114 in.
Over-all width (regular axle) ..	89 $\frac{5}{8}$ in.	89 $\frac{5}{8}$ in.
SHIPPING WEIGHT**	9,732 lbs.	10,762 lbs.

**With equipment for average field service, less fuel and ballast. Add 125 lbs. if equipped with a Quad-Range transmission. Add 375 lbs. if equipped with a Power Shift transmission. Add 450 lbs. for a 4-post Roll-Gard, and add approximately 1000 lbs. for Power Front Wheel Drive.

Group 10

PREDELIVERY, DELIVERY, AND AFTER-SALE SERVICES

PREDELIVERY SERVICE

Because of the shipping factors involved, plus extra finishing touches that are necessary to promote customer satisfaction, proper predelivery service is of prime importance to the dealer.

A tag pointing out the factory-recommended procedure for predelivery service is attached to each new tractor before it leaves the factory.

NOTE: A Caplug is placed in the muffler outlet to prevent turbocharger rotation during transit. Re-

move Caplug before unloading tractor. Reinstall Caplug before transporting the tractor to the customer.

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 certify that the tractor has received the proper predelivery service when that portion of the customer's John Deere Delivery Receipt is completed.

Temporary Tractor Storage

Service	Specification	Reference
Check radiator for coolant loss and antifreeze protection	2 inches above baffle .....	.....
Reduce shipping pressure of tires .....	.....	Operator's manual
Cover tractor and tires for protection and cleanliness .....	.....	.....

Before Delivering Tractor

ELECTRICAL SYSTEM

Install electrolyte and charge batteries .....	.....	FOS-20 Manual
Punch date code on battery tag .....	.....	FOS-20 Manual
Connect Power Front-Wheel Drive wiring harness at connector near control valves ..	.....	Section 40, Group 5
Install light switch knob .....	.....	.....
Clean terminals and connect battery cables ..	.....	Section 40, Group 5
Check light operation and adjustment. Remove flasher if required by local governmental regulations .....	.....	Operator's manual

COOLING SYSTEM

Inspect radiator for coolant loss	2 inches above baffle .....	.....
Check antifreeze protection .....	.....	.....

TIRES AND WHEELS

Adjust pressure of tires .....	.....	Operator's manual
Check front wheel hub bolts, rear wheel rim clamp nuts, and rear wheel retainer cap screws for tightness	Front hub bolts—100 ft-lbs Rear hub bolts—300 ft-lbs Rim clamp nuts—170 ft-lbs .....	.....

Before Delivering Tractor—Continued

Service	Specification	Reference
Check installation of wheel-stop snap ring on outside ends of rear axle .....	.....	.....
LUBRICATION		
Check crankcase oil level	To upper marks on dipstick	Operator's manual
Check transmission-hydraulic system oil level	To top of "SAFE" range on dipstick. Type 303 Special- Purpose Oil	Operator's manual
Lubricate grease fittings	John Deere Multipurpose lubricant	Operator's manual
ENGINE		
Check air intake system — air cleaner and hose connections .....	.....	Operator's manual
Fill fuel tank and start engine	Capacity—46 U.S. gallons	Operator's manual
Check operation of starter, gauges, and indicator lights .....	.....	Operator's manual
Check engine timing	TDC	Section 30, Group 15
Check speed control and fuel shut-off linkages for free operation and adjustment .....	.....	Section 30, Group 25
Check engine speeds	800 rpm, slow idle speed 2400 rpm, fast idle speed	Section 30, Group 20
OPERATION		
Shift transmission through all speeds .....	.....	Operator's manual
Check throttle linkage for free operation .....	.....	Section 30, Group 20
Adjust headlights. Check operation of all lamps .....	.....	Operator's manual
Check Power Front-Wheel Drive operation ..	.....	Operator's manual
Check power takeoff operation .....	.....	Operator's manual
Check differential lock operation .....	.....	Operator's manual
Check brakes and accumulator	3 in. maximum travel for one emergency application immediately after stopping engine	Operator's manual
Check hydraulic system operation: Rockshaft, steering, and remote cylinder ..	.....	Operator's manual
Check implement hitch operation .....	.....	Operator's manual
Check seat operation .....	.....	Operator's manual

Before Delivering Tractor—Continued

Service	Specification	Reference
Check operation of pressurizer blowers, air conditioning system and heater system (if equipped)		Operator's manual
Check air conditioner compressor drive belt . ¼ in. deflection, 15 lb. pull		Operator's manual
Check Sound-Gard Body mount caps	Tighten until effort is required to rotate cap by hand (early models); 9-11 ft-lbs torque required to rotate cap (late models with holes)	Section 10, Group 25
Check window, door, and cowl seals for proper installation		
Check windshield wipers for proper sweep angle and park in off position		Operator's manual
GENERAL		
Check 4-post Roll-Gard mounting bolts for correct torque	150 ft-lbs.	Section 10, Group 25
Check front axle-to-knee bolts for correct torque	Narrow, regular, wide, and PFWD — 370 ft-lbs Hi-Crop — 445 ft-lbs.	Section 80, Group 5
Tighten accessible nuts and cap screws		
Clean tractor and touch up paint		

DELIVERY SERVICE

A thorough discussion of the operation and service of a new tractor at the time of delivery helps to assure complete customer satisfaction. Proper delivery should be an important phase of a dealer's program. A portion of the John Deere Delivery Receipt emphasizes the importance of proper delivery service.

Many complaints have arisen simply because the owner was not shown how to operate and service his new tractor properly. Enough time should be devoted, at the customer's convenience, to introducing the owner to his new tractor and explaining to him how to operate and service it.

IMPORTANT: Install Caplug in muffler outlet if transporting tractor to customer. This will prevent damage to the turbocharger caused by air passing through the turbocharger and rotating it without lubrication when the engine is stopped.

The following procedure is recommended before the serviceman and owner complete the delivery acknowledgments portion of the delivery receipt.

Using the tractor operator's manual as a guide, be sure the owner understands these points thoroughly:

1. Controls and instruments.
2. How to start and stop the engine.
3. The importance of the break-in period.
4. How to use liquid or cast-iron ballast.
5. All functions of the hydraulic system.
6. Using the power takeoff.
7. The importance of safety.
8. The importance of lubrication and periodic services.

After explaining and demonstrating the above features, have the owner sign the delivery receipt and give him the operator's manual.

AFTER-SALE INSPECTION

The purchaser of a new John Deere tractor is entitled to a free inspection within the warranty period after the equipment has been "run in". The terms of this after-sale inspection are outlined on the back of the John Deere Delivery Receipt.

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.

If the recommended after-sale service inspection is followed, the dealer can eliminate a needless volume of service work by preventing minor irregularities from developing into serious problems later on. This will promote strong dealer-customer relations and present the dealer an opportunity to answer questions that may have arisen during the first few days of operation. During the inspection service, the dealer has the further opportunity of promoting the possible sale of other new equipment.

The following inspection program is recommended within the first 100 hours of tractor operation.

Service	Specification	Reference
COOLING SYSTEM		
Check radiator coolant level	2 inches above baffle .....	.....
Clean external surface of radiator .....	.....	.....
Check hoses and connections for leaks .....	.....	.....
FUEL SYSTEM		
Remove water and foreign matter from filter sediment bowl .....	.....	Operator's manual
Bleed fuel system .....	.....	Operator's manual
Tighten loose connections and check entire system for leaks. Correct if necessary .....	.....	.....
Check air cleaner element and unloading valve. Clean element if necessary .....	.....	Operator's manual
ELECTRICAL SYSTEM		
Check specific gravity of battery(s)	Full charge—1.260 at 80° F	Operator's manual
Check level of battery electrolyte	To bottom of filler neck in each cell	Operator's manual
Check fan belt tension	1 inch deflection with a 25 pound force	Operator's manual

Click on the image link below for the full version of the service manual

