3020
Tractor
(123,000-)

JOHN DEERE

TECHNICAL MANUAL

3020 Tractor
(123,000-)

TM1005 (01OCT73) English

John Deere Tractor Works
TM1005 (01OCT73)

LITHO IN U.S.A.
ENGLISH

3020 TRACTOR
(123,000-Up)
Technical Manual
TM-1005 (Apr-70)

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Section 10

GENERAL

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GENERAL TRACTOR SPECIFICATIONS

PTO HORSEPOWER (Official test at 2500 engine rpm with syncro-range transmission)
Diesel . . . . . 71.26 hp.
Gasoline . . . . . 71.37 hp.
LP-gas . . . . . 70.66 hp.

ENGINE
Type . . . 4-stroke cycle, 4-cylinder in-line, valve-in-head

Bore and Stroke:
Diesel . . . . . 4-1/4 x 4-3/4 in.
Gasoline and LP-gas . . 4-1/4 x 4-1/4 in.
Displacement:
Diesel . . . . . 270 cu. in.
Gasoline and LP-gas . . . . . 241 cu. in.
Compression ratio:
Diesel . . . . . 16.5 to 1
Gasoline . . . . . 7.5 to 1
LP-gas . . . . . 9.0 to 1
Firing order 1-3-4-2

ENGINE—Continued
Engine speeds:
Normal slow idle . . . . . 800 rpm
Working range . . . . . 1500 to 2500 rpm

COOLING SYSTEM
Type. Pressurized system with centrifugal pump
Engine temperature control . . . Heavy-duty thermostat

LUBRICATION SYSTEM
Type Force-feed, pressurized with full-flow oil filter.

FUEL SYSTEM
Diesel . . . Direct injection, inlet metering, distributing-type.
Diaphragm-type fuel pump.

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FUEL SYSTEM—Continued

Gasoline. . Pressure system, diaphragm-type fuel pump, single barrel, updraft carburetor with electrical shut-off

LP-gas . . Fuel strainer with electrical shut-off, convertor, and single barrel, updraft carburetor with fuel metering valve

CAPACITIES

Fuel tank
- Diesel and gasoline . . . . . 29 U.S. gals.
- LP-Gas (80% full) . . . . . 33.6 U.S. gals.

Cooling system . . . . . 19 U.S. qts.

Crankcase
- Dry measurement. . . . . 9 U.S. qts.
- Without filter change. . . . . 7 U.S. qts.
- With filter change. . . . . 8 U.S. qts.

Transmission-hydraulic system (Add 4-1/2 U.S. gals. to capacity if equipped with Power Front Wheel Drive)

Syncro-Range
- Dry measurement . . . . . 11 U.S. gals.
- At service intervals . . . . . 8 U.S. gals.

Power Shift
- Dry measurement . . . . . 14 U.S. gals.
- At service intervals. . . . . 11 U.S. gals.

Belt pulley. . . . . 2-1/2 U.S. pints

Hi-crop final drive housing. 1-3/4 U.S. qts.

ELECTRICAL SYSTEM

Type. . . . . 12-volt, negative ground

Alternator. . . . . 12-volt, 55 amps

Battery:
- Diesel . . . . . Two, 6-volt, 75-plate 172-ampere-hour
- Gasoline or LP-gas . . . One, 12-volt, 78-plate 78-ampere-hour

SYNCRO-RANGE TRANSMISSION

Transmission clutch . . . One dry-disk, foot operated

PTO clutch . . . One dry-disk, hydraulically actuated, lever operated

Transmission type . . Constant-mesh, helical, gear synchronized shifting within stations

Speeds. . . . . 8 forward; 2 reverse

POWER SHIFT TRANSMISSION

Engine disconnect. . . . One dry-disk, lever operated clutch

PTO clutch . . . Wet disk, hydraulically actuated, lever operated

Transmission type . . . . . Planetary gears, clutches and brakes wet disk, hydraulically actuated, controlled by speed selector

Speeds. . . . . 8 forward, 4 reverse

GROUND SPEED (Row-crop tractor with 15.5-38 rear tires and 2100 engine rpm)

Gear	Syncro-Range	Power Shift
1st	1.7 mph	1.6 mph
2nd	2.6 mph	2.2 mph
3rd	3.4 mph	3.4 mph
4th	4.4 mph	4.4 mph
5th	5.4 mph	5.7 mph
6th	7.2 mph	7.4 mph
7th	9.0 mph	9.8 mph
8th	14.7 mph	16.4 mph
1st reverse	3.3 mph	1.8 mph
2nd reverse	5.2 mph	2.6 mph
3rd reverse	. . . . .	4.0 mph
4th reverse	. . . . .	5.2 mph

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

Planetary disconnect. . Hydraulic wet brake on ring gear releases when drive is disengaged

POWER TAKE-OFF

Type. . . Single 1-3/8-inch PTO shaft with with mid and rear power take-off. Rear output shafts changed for rear PTO speed conversion.

PTO Speed (2100 rpm):
- Mid PTO . . . . . 1000 rpm
- Rear PTO. . . . . 540 or 1000 rpm

Rear PTO Ahead of Drawbar Hitch Point:
- 540 rpm . . . . . 14 in.
- 1000 rpm . . . . . 15.94 in.

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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.

REAR AXLES

Diameter . . . . . 3.12 in.

Bearings . . . . . Four taper roller

Types available . . . . . Regular, long, and extra long

FRONT TIRES

Row-Crop	6.00-16, 6-ply
	7.50-15, 6-ply
	7.50-16, 6-ply
	7.50-16, 10-ply
	11.00-12, 12-ply
	11.2-24, 6-ply
	12.4-24, 6-ply
Standard	6.50-16, 6-ply
	7.50-16, 6-ply
	7.50-18, 6-ply
Hi-Crop	7.50-18, 6-ply
	7.50-20, 6-ply

REAR TIRES

Row-Crop	13.6-38, 6-ply
	15.5-38, 6-ply
	16.9-34, 6-ply
Standard	16.9-30, 6-ply
	16.9-34, 6-ply
	18.4-30, 6-ply
	18.4-34, 6-ply
Hi-Crop	13.6-38, 6-ply
	15.5-38, 6-ply
	18.4-34, 6-ply

FRONT WHEEL TREAD

Row-Crop

Regular thread. 6.00 tire - 48.5 to 82.3 in.
7.50 tire - 50.8 to 79.9 in.

Wide tread. . . 6.00 tire - 56.5 to 90.3 in.
7.50 tire - 58.8 to 87.9 in.

Power Front Wheel Drive

6-ply R-1 tire . . . . . 64 to 82 in.

6-ply C&R tire . . . . . 66 to 82 in.

Standard

Fixed tread . . . . . 55.5 and 60.8 in.

Adjustable tread . . . . . 50 to 79.3 in.

Hi-Crop . . . . . 60 to 89.3 in.

REAR WHEEL TREAD

Row-Crop

Regular axle

Regular wheel . . . . . 60 to 91 in.

Offset wheel . . . . . 60 to 97 in.

Long axle

Regular wheel . . . . . 60 to 97 in.

Offset wheel . . . . . 60 to 103 in.

Extra long axle

Regular wheel . . . . . 60 to 113 in.

Offset wheel . . . . . 60 to 119 in.

Standard

Regular axle

16.9 tire . . . . . 64 to 91 in.

18.4 tire . . . . . 66 to 91 in.

Long axle

16.9 tire . . . . . 64 to 97 in.

18.4 tire . . . . . 66 to 97 in.

Extra long axle (double tires) 67 to 114 in.

Hi-Crop

Flanged axle . . . . . 60 to 98 in.

Rack and pinion axle . . . . . 73 to 97 in.

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DIMENSIONS

Row-Crop:

Wheel base:	
Adjustable tread front axle and Power Front Wheel Drive	92.8 in.
Double front wheel, Roll-O-Matic, and single front wheel	90.0 in.
* Over-all height	87.5 in.
Height to steering wheel	77.1 in.
Over-all length	140 in.
Width:	
Regular axle	89.6 in.
Long axle	95.9 in.
Extra long axle	111.9 in.
Clearance (crop):	
Adjustable axle	22.6 in.
Rear axle housing	26 in.
Rear axle	26.9 in.
Clearance (drawbar)	15.4 in.
Turning Radius:	
Double front wheel, Roll-O-Matic, and single front wheel	8 ft., 5 in.
Adjustable tread front axle	9 ft., 9 in.
Power Front Wheel Drive (with drive engaged and without brakes)	11 ft.
** Shipping Weight	
Diesel	7610 lbs.
Gasoline	7395 lbs.
LP-gas	7545 lbs.
* Tractors with cab	104.2 in.

***Weights are for tractors with diesel engine, Syncro-Range transmission, 3-point hitch, and regular cast wheel equipment. Add approximately 225 pounds for tractors with PowerShift transmissions, and 1000 pounds for tractors with Power Front Wheel Drive.*

Standard:

Wheel base:	
Short	81.5 in.
Long	92.8 in.
Over-all height	88.4 in.
Height to steering wheel	77.1 in.
Overall-length	140.3 in.
Width:	
Regular axle	89.6 in.
Long axle	95.9 in.
Extra long axle	111.9 in.
Clearance (crop):	
Adjustable axle	22.5 in.
Rear axle	26.6 in.
Rear axle housing	25.7 in.
Clearance (drawbar)	15.1 in.
Turning Radius:	
Short wheel base	9 ft., 3 in.
Long wheel base	9 ft., 9 in.
** Shipping Weight	
Diesel	7560 lbs.
Gasoline	7345 lbs.
LP-gas	7495 lbs.

Hi-Crop:

Wheel base	92.8 in.
Over-all height	104.9 in.
Height to steering wheel	92.7 in.
Over-all length	141.2 in.
Width:	
Flanged axle	78 in.
Rack and pinion axle	95.5 in.
Clearance (crop):	
Front axle	36.3 in.
Rear axle	26.9 in.
Rear housing	36.5 in.
Turning radius	10 ft.
** Shipping Weight	
Diesel	8020 lbs.
Gasoline	7805 lbs.
LP-gas	7955 lbs.

(Specifications and design subject to change without notice.)

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Group 10

PREDELIVERY, DELIVERY, AND AFTER-SALE SERVICE

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.

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	Specifications	Reference
Check radiator for coolant loss and antifreeze protection	1-1/2 inches above baffle	
Drain fuel system (gasoline)		Operator's manual
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
Stamp date code on battery		FOS-20 Manual
Connect alternator. Remove resistor if present. Do not attempt to polarize.		Section 40, Group 10
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 operation of cab controls		Operator's Manual

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BEFORE DELIVERING TRACTOR—Continued

Service	Specifications	Reference
Cooling System		
Inspect radiator for coolant loss	1-1/2 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 - 85 ft-lbs Rear hub bolts - 300 ft-lbs Rim clamp nuts - 170 ft-lbs	
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	SAE multipurpose-type grease	Operator's manual
Check distributor lubrication	Distributor cam lubricant	Section 40, Group 20
Engine		
Check air cleaner		Operator's manual
Fill fuel tank and start engine	Diesel and gasoline - 29 U.S. gallons; LP-gas - 33.6 U.S. gallons	Operator's manual
Check operation of starter, alternator, flasher, gauges, and indicator lights		Operator's manual
Check engine timing	Diesel - TDC Gasoline - 20° BTDC, 2200 rpm LP-gas - 25° BTDC, 2100 rpm	Section 30, Group 10 Section 40, Group 20
Check throttle linkage for free operation		Section 20, Group 40
Check manifold heat valve operation (gasoline)		Operator's manual
Check withdrawal valve operation (LP-gas)		Operator's manual

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BEFORE DELIVERING TRACTOR—Continued

Service	Specifications	Reference
Check engine speeds; corresponding 1000 rpm PTO shaft speed given in parenthesis	Diesel - 800 (387) rpm, 2270 (1097) rpm, 2650 (1281) rpm Gasoline and LP-gas - 800 (387) rpm, 2360 (1140) rpm, 2690 (1300) rpm.	Section 20, Group 35
Operation		
Check transmission clutch free travel (Syncro-Range transmission).	Approximately 1-1/2-inch free travel (at least 3/4 in.)	Operator's manual
Check engine disconnect clutch (Power Shift transmission)	No tendency for tractor to creep with disconnect clutch disengaged	Section 50, Group 15
Shift transmission through all speeds		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
Adjust headlights and check operation		Operator's manual
General		
Tighten accessible nuts and cap screws		
Clean tractor and touch up paint		

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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.

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. 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.

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 that 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.

INSPECTION PROCEDURE

Service	Specification	Reference
Cooling System		
Check radiator coolant level.	1-1/2 inches above baffle.	. . . . .

INSPECTION PROCEDURE—Continued

Service	Specification	Reference
Clean external surface of radiator core		
Check hoses and connections for leaks		
Fuel System		
Remove water and foreign matter from fuel pump and filter sediment bowls		Operator's manual
Bleed fuel system		Operator's manual
Tighten loose connections and check entire system for leaks, correct if necessary		
Check air cleaner cup, 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 belt tension	1-inch deflection with a 25-pound force	Operator's manual
Start engine and check operation of starter, lights, indicator lamps, and cab controls		Operator's manual
Lubrication		
Check crankcase oil level	To upper marks on dipstick.	Operator's manual
Check transmission-hydraulic system oil level	In "SAFE" range on dipstick. Use John Deere Type 303 Special-Purpose Oil	Operator's manual
Check distributor lubrication	Distributor cam lubricant	Section 40, Group 20
Engine		
Check valve clearance (static, hot)	Diesel - 0.018 inch. Gasoline or LP-gas - Intake - 0.015 inch. Exhaust - 0.028 inch	Operator's manual

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INSPECTION PROCEDURE—Continued

Service	Specification	Reference
Check engine speed under load, fuel consumption, and horsepower.....	Specification	Group 15 of this Section.
Clutches and Differential Lock		
Check transmission clutch free travel (Syncro-Range transmission) . . .	Approximately 1-1/2-inch free travel	Operator's manual
Check engine disconnect clutch (Power Shift transmission).	No tendency for tractor to creep with disconnect clutch disengaged.	Section 50, Group 15
Shift transmission through all speeds	. . . . .	Operator's manual
Check Power Front Wheel Drive operation	. . . . .	Operator's manual
Check PTO clutch and brake operation	. . . . .	Section 50, Groups 40 & 45
Check differential lock operation. . .	. . . . .	Operator's manual
Hydraulic System		
Check rockshaft and remote cylinder operation.	. . . . .	Section 70, Group 30
3-point hitch negative stop adjustment	1/8th-turn back out after contacting transmission case	Section 70, Group 30
Check power steering	Smooth, easy operation	Section 70, Group 25
Check brakes and accumulator	3 in. maximum travel for one emergency application immediately after stopping engine	Operator's manual
Nuts and Cap Screws		
Tighten accessible nuts and cap screws that seem to require adjustment.	. . . . .	. . . . .

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Group 15
TUNE-UP

GENERAL INFORMATION

Before tuning up a tractor, determine whether a tune-up will restore operating efficiency. When there is doubt, the following preliminary tests will help to determine if the engine can be tuned-up. If the condition is satisfactory, proceed with the tune-up. Choose from the following procedures only those necessary to restore the unit.

PRELIMINARY ENGINE TESTING

Operation	Specification	Section-Group Reference
Dynamometer Test (at 2500 engine rpm)	Compare with previous recorded output; compare with output after tune-up	FOS 30 Manual, Chapter 12
Compression Test		
Diesel	400 psi at 275 rpm	FOS 30 Manual, Chapter 12
Gasoline	180 psi at 170 rpm	
Manifold Depression Test (gasoline)	18-20 inches Mercury	FOS 30 Manual, Chapter 12
Engine Coolant Check Test	No air bubbles or oil film in radiator	FOS 30 Manual, Chapter 12

ENGINE TUNE-UP

Operation	Specification	Section-Group Reference
Air Intake System		
Service air cleaner and check system for leaks	. . . . .	FOS 30 Manual, Chapter 12
Check system for restrictions using water manometer	. . . . .	FOS 30 Manual, Chapter 12
Normal reading (inches of water):		
Diesel - with precleaner and extension	9 in. at 2500 rpm	. . . . .
without precleaner and extension	4 in. at 2500 rpm	. . . . .
Gasoline - with precleaner and extension	7 in. at 2500 rpm (full load)	. . . . .
without precleaner and extension	3 in. at 2500 rpm (full load)	. . . . .
Maximum permitted reading	20 in. at 2500 rpm (full load)	. . . . .
Check restriction indicator light operation.	25 in. at 2500 rpm (full load, tractors with safety filter)	. . . . .
	19-21 in. at 2500 rpm (full load)	
	24-26 in. at 2500 rpm (full load, tractors with safety filter)	. . . . .

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