John Deere 2000 Series Tractors

JOHN DEERE

SERVICE MANUAL

John Deere 2000 Series Tractors

SM2036 01FEB66 English

John Deere Dubuque Works
SM2036 01FEB66

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ENGLISH

SERVICE MANUAL

JOHN DEERE 2000 SERIES WHEEL TRACTORS

CONTENTS

SM-2036 (2-64)

TO THE JOHN DEERE SERVICEMAN

This service manual contains maintenance instructions for John Deere 2000 Series Wheel tractors. Included are complete instructions for removal, disassembly, inspection, repair, assembly and installation of the major parts and assemblies of the tractor.

In addition, the manual contains brief descriptions of the more complicated systems of the tractor, and tells how they operate. Dimensions of many new wearing parts are given as an aid in determining when parts replacement is necessary. Tests and adjustments, required to keep the tractor operating efficiently, are explained in detail.

This manual was planned and written for the Service Department; its place is in the shop. Use the manual whenever in doubt about correct maintenance procedures. Use it as a text book for training new Service Department personnel who are unfamiliar with John Deere Tractors.

Daily use of the Service Manual as a guide for any and all service problems will reduce error and costly delay to a minimum and assure you the best in finished service work. In many instances your customer's confidence in your work will be improved when he sees you using the Service Manual. He knows you are following approved maintenance procedures and making proper adjustments. There is no guesswork when you use the manual.

Section 10
DESCRIPTION AND SPECIFICATIONS

Group 5
DESCRIPTION

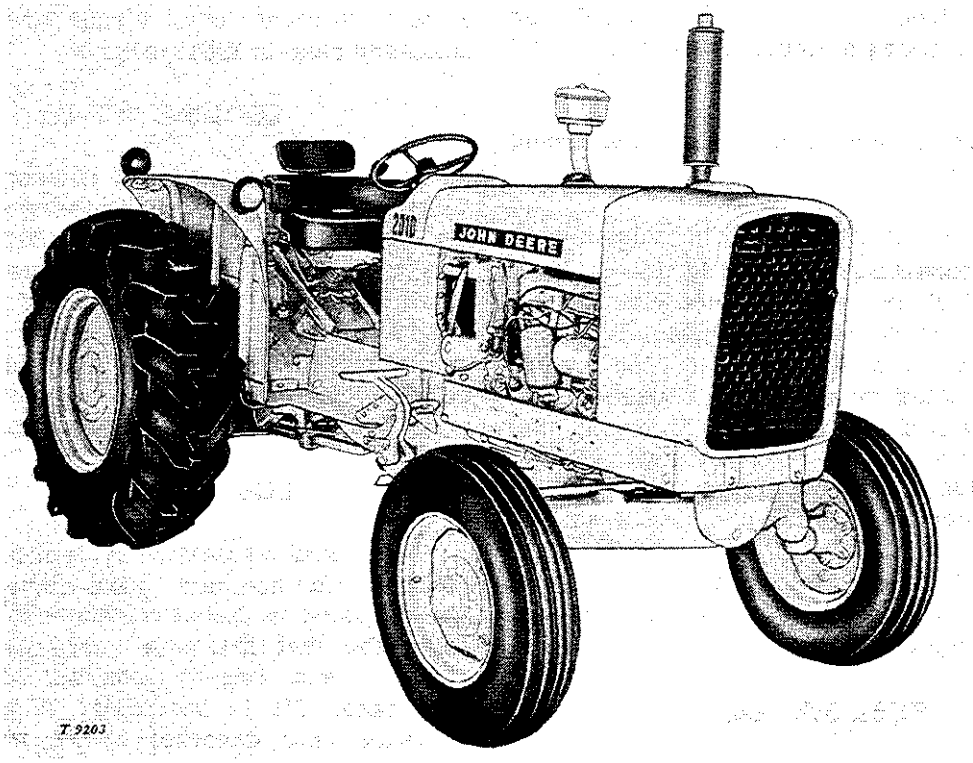

Fig. 10-5-1—Right Side View of John Deere 2010 Wheel Tractor

The John Deere 2010 Wheel Tractor is a low-built, general-purpose, industrial tractor. Features are described briefly in the paragraphs which follow.

DIESEL ENGINES

Each diesel tractor is powered by a vertical, 4-cylinder, valve-in-head, fuel injection, four-stroke cycle, internal combustion engine. A bore of 3-7/8 inches and a stroke of 3-1/2 inches give a piston displacement of approximately 165 cubic inches.

The compression ratio of the diesel engine is 19 to 1.

Crankshaft rotation is clockwise when viewed from the front.

The engine has replaceable precision-type main and connecting rod bearing inserts. All bearings and other parts of the engine are lubricated by a force-feed and splash-type system with an oil filter having a replaceable paper-type filter element. The crankcase is ventilated by means of a vent tube attached to the rocker arm cover and discharging below the crankcase flange. Engine speeds and injection timing are controlled by the fuel injection pump.

Replaceable, wet cylinder sleeves are used in the cylinder block.

GASOLINE ENGINES

Each gasoline tractor is powered by a vertical, 4-cylinder, valve-in-head, four-stroke cycle, internal combustion engine. A bore of 3-5/8 inches and a stroke of 3-1/2 inches give a piston displacement of approximately 145 cubic inches.

The compression ratio of the gasoline engine is 7.9 to 1. (Special pistons are available for high altitudes giving a compression ratio of 9.0 to 1.)

Crankshaft rotation is clockwise when viewed from the front.

The engine has replaceable precision-type main and connecting rod bearing inserts. All bearings and other parts of the engine are lubricated by a force-feed and splash-type system with a replaceable oil filter. The crankcase is ventilated by means of a vent tube attached to the rocker arm cover. This tube discharges below the crankcase flange. Engine speeds are controlled by a fly-weight-type governor, gear-driven from the camshaft gear.

Replaceable wet cylinder sleeves are used in the engine block. This feature makes engine overhaul easier and less expensive.

FUEL SYSTEM

The diesel engine uses a distributor-type fuel injection pump. The fuel system consists of the fuel tank, two fuel filters (one filter on tractors 42001-up), fuel strainer, fuel injection pump, fuel injector nozzles, and turbulence chambers. The fuel injection pump is an opposed plunger, inlet metering, distributor-type. Injector nozzles are of the pintle type and are located in turbulence chambers mounted at the top of each cylinder.

The gasoline fuel system is equipped with a 16 U.S. gallon fuel tank. The carburetor is a single-throat, updraft, adjustable idle jet type.

IGNITION

Diesel engines are equipped with an electrical pre-heating system called "Glow Plugs" which are used to heat the turbulence chambers during cold starting. A 12-volt battery actuates this system.

Gasoline models have a battery-distributor type ignition system with automatic spark advance. A 12-volt battery, generator, and starter are standard equipment.

LIGHTING SYSTEM

All lighting equipment is optional and includes grille-mounted headlights, single fender-mounted headlights, a dash light, a tail light, a rear warning light, a rear work light, and auxiliary plug-in light socket.

COOLING SYSTEM

The engines are liquid cooled; the coolant flows by pressure through passages around the sleeves in the block, and around the valves in the cylinder head. Coolant is circulated evenly in all passages in the block, head, and through the radiator by a centrifugal water pump located on the cylinder block, and operated by the fan belt. A thermostat and fixed bypass insure a quick and thorough engine warm-up.

LUBRICATION

The engine lubrication system is forced by a positive displacement, gear-driven oil pump. The oil pump on diesel models is located underneath the fuel injection pump (distributor on gasoline) and extends into the bottom of the crankcase. Oil is fed under 35 to 50 pounds pressure onto governor bearings, crankshaft main bearings, and connecting rods, and splashed onto piston pins, and the valve tappet assembly. The lubrication system employs a bypass oil filter (-42000) or a full-flow oil filter (42001-up) with a replaceable filter element.

CLUTCH

The engine clutch is a spring-loaded, single dry-disk, pedal-operated clutch, located in the clutch housing and working off the engine flywheel.

TRANSMISSION

Two types of transmissions are available for the 2000 Series Wheel Tractor: H-L-R or Constant Mesh. Each transmission is described briefly in the following paragraphs.

H-L-R TRANSMISSION

The H-L-R transmission is basically a standard collar shift transmission plus an automatic reverser and underdrive unit. The gears in the speed change box are shifted manually by clutching, while the gears in the range change box are shifted "on the go" without clutching by means of three hydraulic clutches—high, low, and reverse. (On 2010 Fork Lift Tractors, a special version of the H-L-R transmission is available with low range locked out. This transmission is called a direction reverser unit, giving comparable speeds in forward and reverse ranges.)

See Section 130 for further details.

CONSTANT - MESH TRANSMISSION

The constand-mesh transmission is a sliding collar type shift in series with four speed gear ratios to provide eight forward speeds and three reverse speeds. All shifts are made manually by clutching.

See Section 120 for further details.

POWER TAKE-OFF

The continuous running, "live," 540-1000 rpm dual PTO is engine-driven from the rear of the tractor and has its own separate clutch.

BRAKES

The disk-type, self-energizing brakes may be operated individually or simultaneously by means of the brake pedals. Brake housings are located on the outside of the final drive housings.

STEERING MECHANISM

Tractors are steered by a steering gear and drag link which connects to a spindle mechanism over the front wheels. Power steering, which provides a hydraulic assist to steering efforts, is available.

REAR WHEELS

The standard disk-type wheels are equipped with an offset in order to provide a two-position rear wheel tread. The regular setting of 62 inches can be increased to 74 inches by reversing the wheels. (Treads on 16.9 x 28 tires are 63 and 73 inches.)

FRONT AXLE

The front axle is of solid, nodular iron, one-piece construction and provides a fixed tread of 54 inches. "Swept-back" axle design permits sharper turns.

HYDRAULIC SYSTEM

The tractor is equipped with a constant-running hydraulic pump as regular equipment. Mounted on the transmission front cover, the pump is driven by the powershaft driven gear. The hydraulic pump supplies oil under pressure for power steering, remote cylinders, and rear rockshaft.

The hydraulic system is under constant pressure, and is "live"; that is, it can be operated when the engine is running, whether the tractor is moving or not.

The system may be equipped with either one or two remote cylinder valves, and one or two pairs of breakaway couplers. This permits use of one or two remote cylinders to hydraulically operate various tools. Remote cylinders may be of the single-acting or double-acting type.

The tractor may also be equipped with a single rear rockshaft which utilizes hydraulic power to control integral tools mounted on the 3-point hitch.

Group 10
SPECIFICATIONS

PERFORMANCE	Diesel	Gasoline
Nebraska Test No.	799	800
Max. drawbar pull	4553 lbs.	4596 lbs.
Tractor weighing	6392 lbs.	6310 lbs.
Max. drawbar pull without ballast	3356 lbs.	3239 lbs.
Max. PTO horsepower	46.67	46.86
Max. drawbar horsepower	41.40	40.82
Rim pull (pounds) Gear		
1st	4020	3991
2nd	3735	3713
3rd	3147	3187
4th	2303	2271
5th	1780	1825
6th	1255	1235
7th	1026	1027
8th	--Not Tested--	
ENGINE		
Flywheel horsepower (SAE corrected)	52.0	52.0
Torque, max., at 1500 rpm (SAE corrected)	124.5 ft-lbs.	119.0 ft-lbs.
Torque, at 2500 rpm (SAE corrected)	109.3 ft-lbs.	109.3 ft-lbs.
Number of cylinders	4	4
Bore and stroke	3-7/8 x 3-1/2 in.	3-5/8 x 3-1/2 in.
Displacement in cubic inches	165	145
NACC or AMA horsepower rating for tax purposes	24.03	21.03
Intake valve clearance (cold)	0.012 in.	0.012 in.
Exhaust valve clearance (cold)	0.018 in.	0.018 in.
Compression ratio	19 to 1	7.9 to 1*
Slow-idle (rpm)	800 rpm	600 rpm
Fast-idle (rpm)	2650 rpm	2700 rpm
Working speed range (rpm)	1500 to 2500 rpm	1500 to 2500 rpm
Engine clutch:		
Constant mesh	11-inch, single disk	
H-L-R	10-inch, single disk	

TRANSMISSION

H-L-R - Hydraulic assist with 8 forward speeds and 4 reverse speeds. Wet clutches.

Constant mesh - Manual sliding gear with 8 forward speeds and 4 reverse speeds. Helical Gears.

(Travel speeds are shown on next page.)

CAPACITIES (U.S. Standard Measures)

Fuel tank	16 gals.
Engine crankcase (including filter)	5 qts.
Cooling system	3 gals.
Air cleaner cup	To mark
Transmission case:	
H-L-R	27 qts.
Constant mesh	32 qts.
Final drive cases (each)	1 gal.

FINAL DRIVES (-29010)

Gear reduction ratio in first gear (engine to axle) (Constant Mesh transmission) -- 131 to 1

Gear reduction ratio in 8th gear (engine to axle) (Constant Mesh transmission) -- 18 to 1

Gear reduction ratio in first gear (engine to axle) (H-L-R transmission) -- 150.4 to 1

Gear reduction ratio in 8th gear (engine to axle) (H-L-R transmission) -- 20.8 to 1

FINAL DRIVES (29011-Up)

Gear reduction ratio in first gear (engine to axle) (Constant Mesh transmission) -- 143 to 1

Gear reduction ratio in 8th gear (engine to axle) (Constant Mesh transmission) -- 20 to 1

Gear reduction ratio in first gear (engine to axle) (H-L-R transmission) -- 164.3 to 1

Gear reduction ratio in 8th gear (engine to axle) (H-L-R transmission) -- 22.7 to 1

ELECTRICAL SYSTEM

Battery (dry) voltage (nominal)	12 volts
Battery specific gravity - full charge	1.250 (plus or minus 0.010)
Battery terminal grounded	positive
Generator regulation	voltage regulator

IGNITION SYSTEM (Gasoline)

Type	battery-distributor
Distributor point gap	0.022 in.
Spark Plugs:	
Size	14 mm
Gap	0.025 in.

*9.0 to 1 for high altitude pistons

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DIMENSIONS

(Tractor equipped with 14.9 x 28 rear tires, 6:00 x 16 front tires.)

Height to top of hood	55-3/8 in.
Height to top of steering wheel	61-3/8 in.
Over-all height	74-3/4 in.
Over-all width, min.	75-11/16 in.
Over-all length, tire to tire edge	123-1/16 in.
Wheelbase	82 in.
Clearance (front axle)	16-5/8 in.
Clearance (minimum)	12-3/16 in.
Shipping weight (approx.)	5000 lbs. (Gasoline)
	5100 lbs. (Diesel)

STEERING

Steering ratio	3-1/4 turns
Curb clearance circle with brakes	250 in.

TIRE EQUIPMENT

Front:	6:00 x 16	4-ply
	6.00 x 16	6-ply
	6.50 x 16	8-ply
	7.50 x 16	6-ply
	7.50 x 16	10-ply
	9.00 x 16	8-ply
Rear:	12.4 x 28	4-ply
	14.9 x 28	8-ply
	16.9 x 24	6-ply
	16.9 x 28	6-ply

WHEEL TREADS

Front:	54 inches (fixed tread)
Rear:	62 inches (regular tread)
	74 inches (wheels reversed)

TRANSMISSION TRAVEL SPEEDS (MPH based on 14.9 x 28 rear tires and zero slippage)

CONSTANT MESH (-29010)

Gear	1500 rpm	1900 rpm	2500 rpm
1st	1.6	2.1	2.7
2nd	2.3	3.0	3.9
3rd	2.9	3.6	4.8
4th	4.0	5.1	6.7
5th	5.0	6.4	8.4
6th	7.1	9.0	11.9
7th	8.4	10.6	14.0
8th	11.9	15.0	19.8
Rev. 1	2.2	2.8	3.6
Rev. 2	3.8	4.8	6.3
Rev. 3	6.6	8.4	11.0

H-L-R (29010)

Gear	1500 rpm	1900 rpm	2500 rpm
1st	1.4	1.8	2.4
2nd	2.0	2.6	3.4
3rd	2.5	3.2	4.1
4th	3.5	4.5	5.9
5th	4.4	5.5	7.3
6th	6.2	7.8	10.3
7th	7.3	9.2	12.2
8th	10.3	13.1	17.2
Rev. 1	1.9	2.5	3.2
Rev. 2	3.4	4.3	5.6
Rev. 3	5.9	7.5	9.9

CONSTANT MESH (29011-Up)

Gear	1500 rpm	1900 rpm	2500 rpm
1st	1.5	1.9	2.5
2nd	2.1	2.7	3.6
3rd	2.6	3.3	4.4
4th	3.7	4.7	6.2
5th	4.6	5.8	7.7
6th	6.5	8.3	10.9
7th	7.7	9.7	12.8
8th	10.9	13.8	18.1
Rev. 1	2.0	2.5	3.3
Rev. 2	3.4	4.4	5.7
Rev. 3	6.1	7.7	10.1

H-L-R (29011-Up)

Gear	1500 rpm	1900 rpm	2500 rpm
1st	1.3	1.7	2.2
2nd	1.8	2.4	3.1
3rd	2.3	2.9	3.8
4th	3.2	4.1	5.4
5th	4.0	5.1	6.7
6th	5.7	7.2	9.5
7th	6.7	8.5	11.1
8th	9.5	12.0	15.8
Rev. 1	1.8	2.3	3.0
Rev. 2	3.1	3.9	5.1
Rev. 3	5.4	6.9	9.0

(Specifications and design subject to change without notice.)

Section 20
TRACTOR SEPARATION

Group 5
SEPARATING FRONT END SUPPORT FROM ENGINE

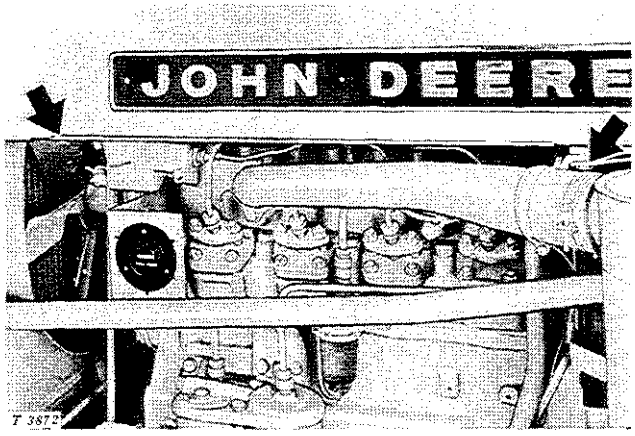

Fig. 20-5-1–Hood Attaching Points

Remove fuel tank cap and vertical muffler. Disconnect light leads if tractor is so equipped. Remove cap screws attaching heat shield to hood.

Loosen hex. nuts on the eyebolts attaching the front of the hood to the grille.

Remove the hex. nuts, washers, and cap screws attaching rear of hood to the battery support and lift off hood.

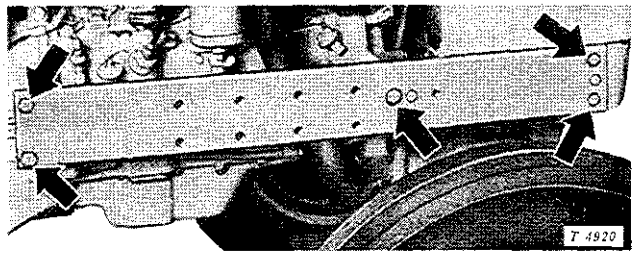

Fig. 20-5-2–Side Frame Attaching Screws

Remove the two cap screws attaching rear of each side frame to the clutch housing. Remove the three cap screws attaching the front of each side frame to the front end support. Pull side frames free from dowels.

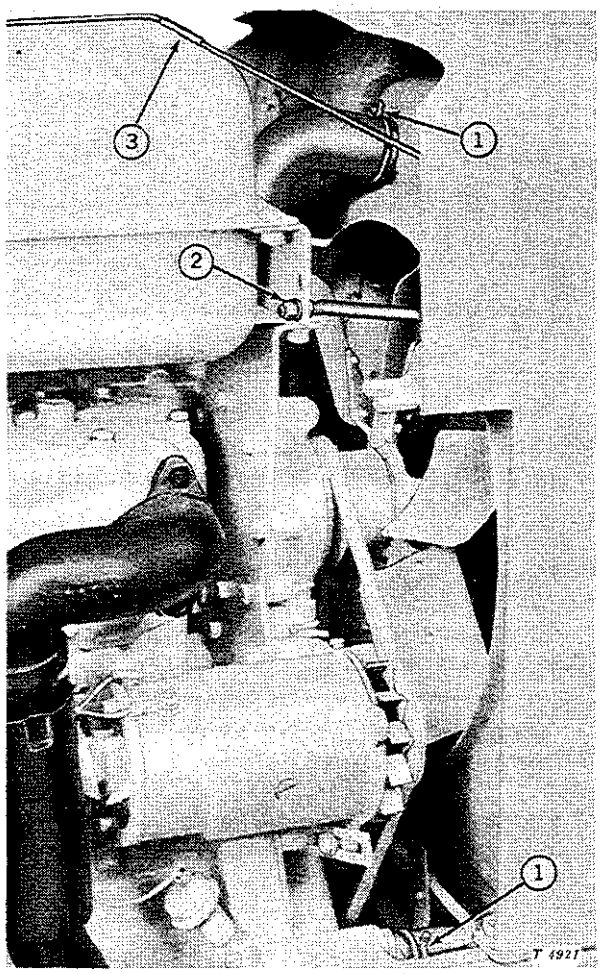

Fig. 20-5-3–Disconnecting Radiator

1. Drain radiator and disconnect water inlet and outlet hoses.

2. Remove the hex. nuts securing radiator brace rods to the fuel tank bracket.

3. Disconnect fuel tank vent line.

Remove grille screen. Remove the four machine screws attaching radiator baffle to grille housing. Disconnect drag link socket assembly from steering spindle arm and free the socket assembly from the baffle (Fig. 20-5-4).