John Deere 4000 Series Tractors

JOHN DEERE

SERVICE MANUAL

John Deere 4000 Series
Tractors

SM2039 (01APR67) English

John Deere Tractor Works
SM2039 (01APR67)

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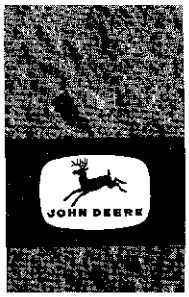


SERVICE MANUAL

JOHN DEERE

4000 SERIES

TRACTORS

CONTENTS

SM-2039 (7-63)

TO THE JOHN DEERE SERVICEMAN

This service manual contains maintenance instructions for John Deere 4000 Series 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. Tests and adjustments, required to keep the tractor operating efficiently, are explained in detail.

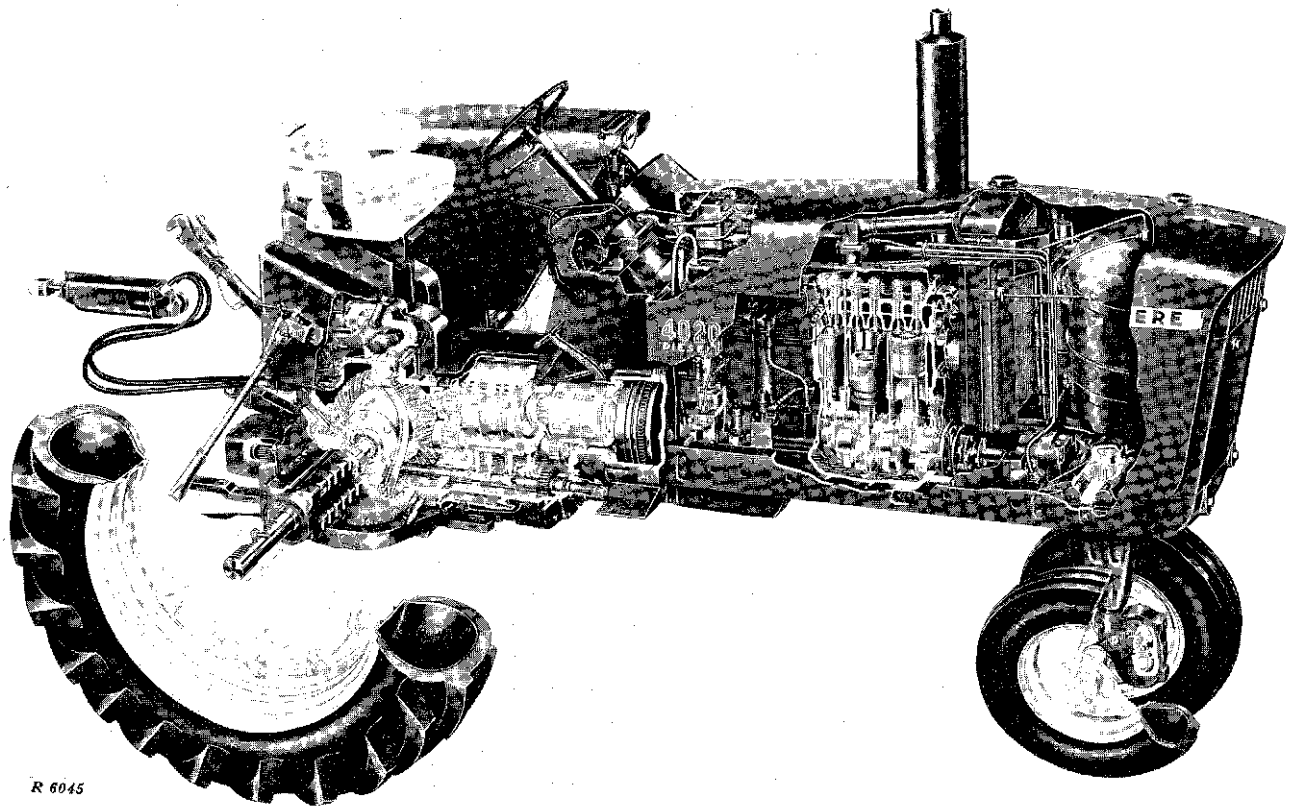
A section on "Specifications" lists dimensions of many new wearing parts as an aid in determining when parts replacement is necessary.

A section on "Tune-Up and Adjustment" contains instructions for performing the services necessary to help the tractor perform efficiently and economically after it has been in the field for some time.

A section on "Special Tools" lists special tool equipment which enables the serviceman to service the tractor efficiently with a minimum of time expended.

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.



Cutaway of John Deere 4020 Row-Crop Tractor with Diesel Engine

Section 10

DESCRIPTION, OPERATION, AND SPECIFICATIONS

Group 5
DESCRIPTION

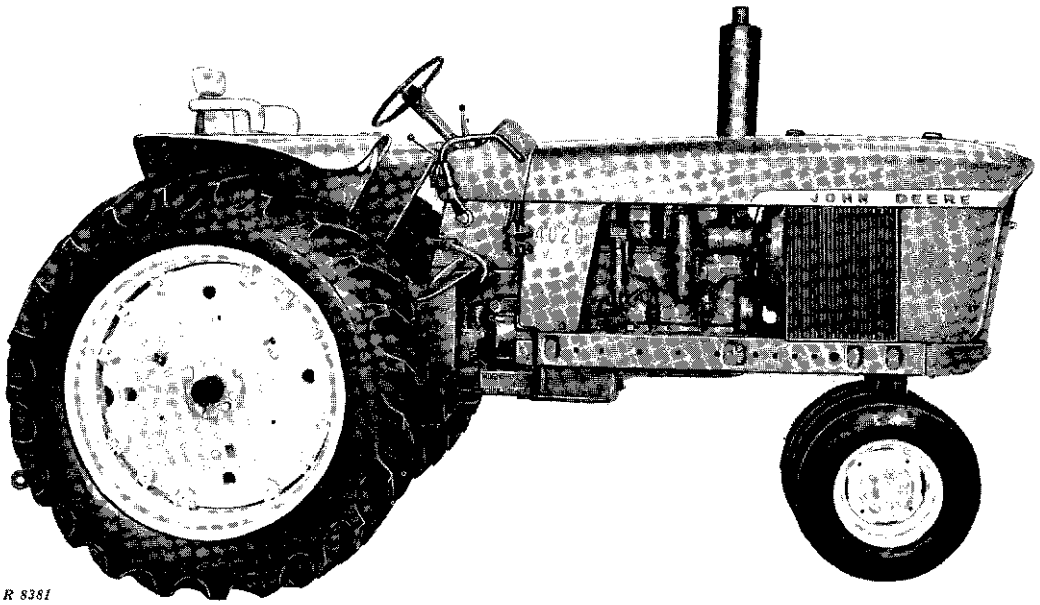


Fig. 10-5-1—Right-Hand Side View of John Deere 4020 Row-Crop Tractor with Diesel Engine and Power Shift Transmission

John Deere 4020 Tractors (Fig. 10-5-1) are heavy-duty tractors available in three basic styles, Row-Crop, Standard, and Hi-Crop.

These tractors may have a Syncro-Range transmission providing eight forward and two reverse speeds, or a Power Shift transmission providing eight forward and four reverse speeds.

John Deere 4010 Tractors were available in three basic styles: Row-Crop, Standard and Hi-Crop (Fig. 10-5-3).

These tractors have a Syncro-Range transmission providing eight forward and three reverse speeds.

In all styles the majority of parts and components are identical.

The features of the tractors are described briefly in the paragraphs which follow. Full descriptions of their various assemblies are given in the other sections throughout this manual.

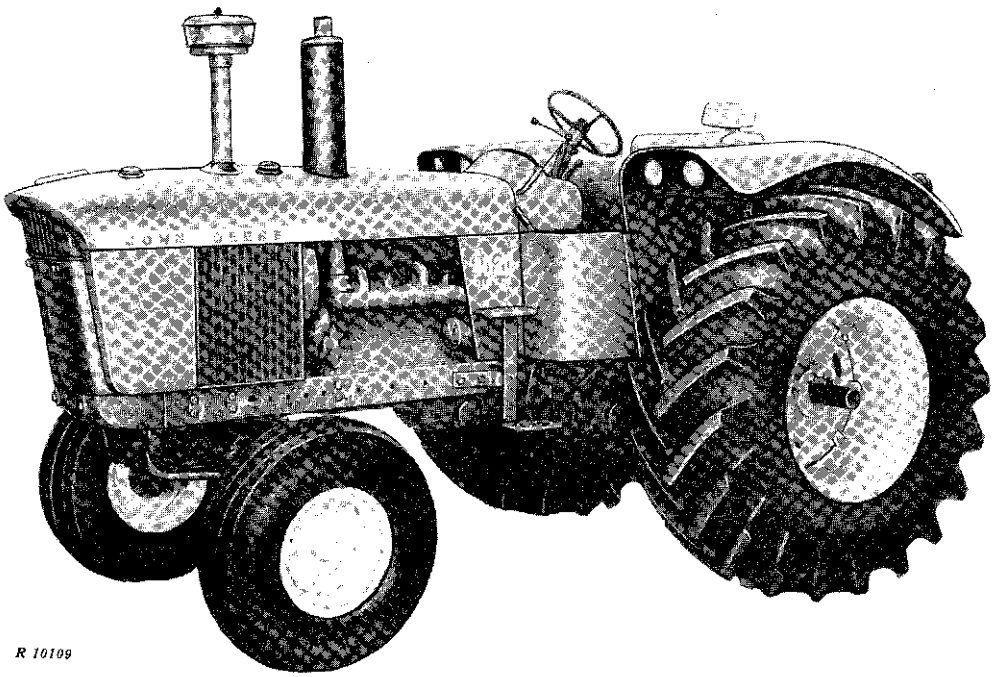


Fig. 10-5-2—Left-Hand Side View of John Deere 4020 Standard Tractor with Diesel Engine (Serial No. 91000 and After)

SERIAL NUMBERS

Each engine bears a serial number on the generator mounting pad on the front right side of the cylinder block.

The tractor serial number is located to the right of the center link attaching bracket on the rear of the transmission case.

LP-Gas fuel tanks each bear a serial number.

MODEL NUMBERS

Model numbers are carried by the distributor on spark ignition engines, the fuel injection pump on diesel engines, the main hydraulic pump, rockshaft valve housing, and remote cylinder selective control valve housings.

ENGINE

Three types of variable-speed engines are furnished for the tractor. Two are spark ignition engines - one using gasoline for fuel, the other using LP-Gas. The third is a compression-- ignition diesel engine.

All engines have six in-line cylinders. At 2200 rpm, 4020 engines develop up to 88 horsepower measured at the PTO, and 4010 engines up to 80 horsepower. (These are maximum observed horsepower ratings.)

CRANKCASE VENTILATING SYSTEM

Crankcase ventilation is accomplished by a liquid-seal, impeller-type ventilating pump.

CLUTCH

Both 4020 and 4010 Tractors, equipped with Syncro-Range transmissions, have spring-loaded dry-disk-type transmission clutches located in a recess at the rear of the engine flywheel. These clutches are operated by a pedal at the left side of the operator's platform.

Power Shift transmissions (optional equipment) in 4020 Tractors are hydraulically-actuated, having no spring-loaded transmission clutch.

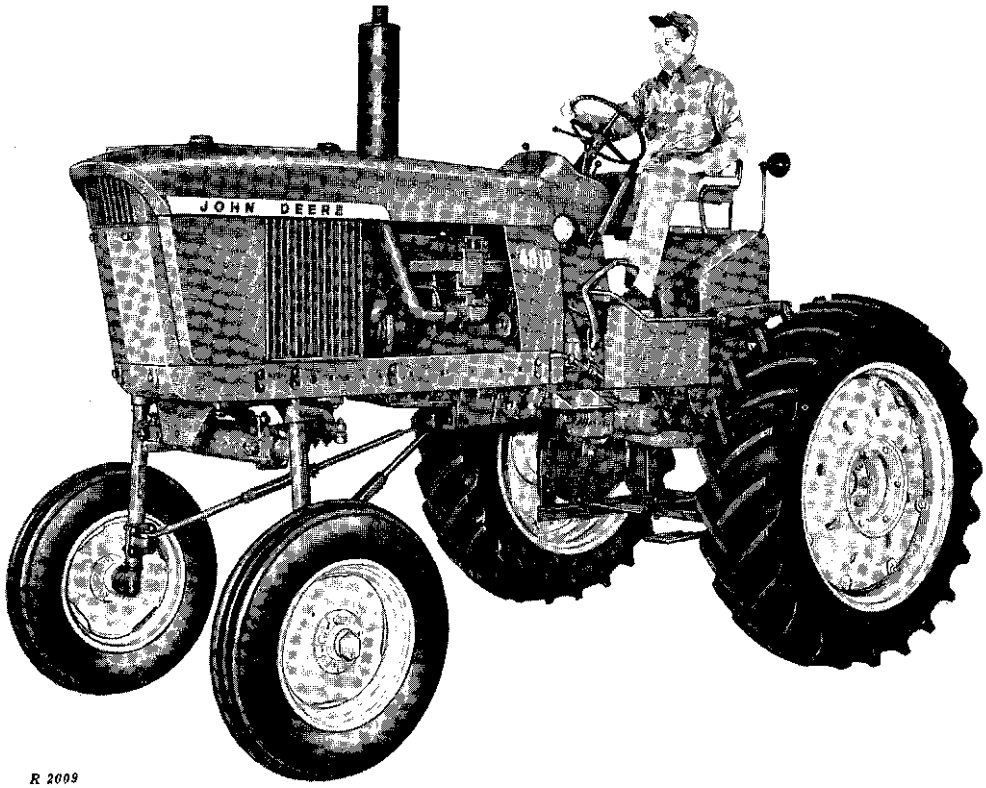


Fig. 10-5-3—Left-Hand Side View of John Deere 4010 Hi-Crop Tractor with Gasoline Engine

A pedal, located at the left side of the operator's platform, can be used for "inching" the tractor or for emergency stops.

A spring-loaded clutch, located in a recess at the rear of the engine flywheel, provides a means of disengaging the engine from the transmission for easier cold weather starting.

The clutch is operated by the engine disconnect lever located to the left of the control support. Pulling the lever to the rear disengages the engine. The lever will latch in this position. The engine is engaged by pulling back slightly on the lever while pulling the latch button at the left rear of the steering support and allowing the clutch to engage.

FUEL SYSTEM

The large-capacity fuel tank on all tractors is located at the front of the tractor just ahead of the radiator.

DIESEL

In diesel systems a fuel pump, driven by the camshaft, provides a constant supply of fuel to the injection pump.

A large-capacity fuel filter is connected between the fuel pump and the injection pump.

The filter contains two replaceable micronic filtering elements.

GASOLINE

In gasoline systems, a fuel pump driven from the camshaft, assures a constant supply of gasoline to the updraft carburetor. A filter and sediment bowl on the fuel pump, and a screen in the carburetor, insure that the gasoline flowing to the engine is clean.

LP-GAS

The LP-Gas fuel system includes a converter which assures that the fuel is in vapor form when supplied to the engine updraft carburetor. The converter uses the heat from the engine coolant for its operation.

A combination filter and electric solenoid valve is incorporated in the system. The valve is opened electrically when the ignition switch is turned on and closes when the switch is turned off. This prevents leakage of the gas into the engine when it is not in operation.

ELECTRICAL SYSTEM

Tractors with spark ignition engines have a 12-volt grounded-type electrical system. A three-unit generator regulator is used to control generator output. An enclosed, solenoid-shift starter is used to start the engine.

Diesel tractors use a 24-volt split-load-type electrical system. In this system a 24-volt generator with a three-unit regulator supplies current to maintain the charge in two 12-volt batteries.

The lighting and accessory circuits are of the grounded type, using current at 12 volts.

IGNITION SYSTEM

Spark ignition engines are equipped with a battery ignition system. The distributor is located at the right rear of the engine block. It is driven at one-half engine speed from the engine camshaft. The distributor has a centrifugal advance mechanism.

The ignition system is of the bypass type using current at 12 volts while cranking the engine to improve starting. After cranking is stopped, the current is cut down by a resistor to 6 volts to supply the 6-volt ignition coil.

COOLING SYSTEM

All 4000 Series Tractors have a pressure-type cooling system with a centrifugal-type pump that provides continuous circulation of the coolant. Two thermostats maintain constant engine coolant temperature.

The system is of the bypass type which permits circulation of coolant through the engine without passing through the radiator. This feature allows the engine to reach operating temperature in a shorter length of time. After the coolant reaches operating temperature, the thermostats open allowing circulation of the coolant through the radiator to maintain constant operating temperature.

TRANSMISSION

SYNCRO-RANGE

Syncro-Range transmissions are furnished as optional equipment on 4020 Tractors and as regular equipment on all 4010 Tractors. This transmission has four shift "stations" with synchronized shifting within stations and collar shifting between stations.

The transmission has eight forward speeds. 4020 Tractors have two reverse speeds; 4010 Tractors three reverse speeds. Shifting is accomplished by a shift lever located at the right of the instrument panel.

Normally, shifting is accomplished within stations while the tractor is on the move, but the tractor should be stopped to shift between stations.

Constant-mesh, helical gears are used in all transmission speeds.

POWER SHIFT

The planetary-type, hydraulically actuated Power Shift transmission is optional on 4020 Tractors. Any forward or reverse speed can be obtained while the tractor is on the move.

The Power Shift transmission has eight forward and four reverse speeds.

Transmission speed changes are accomplished by a speed selector located on the right side of the tractor dash.

A mechanical disconnect, at the rear of the transmission permits disengaging the final drive assembly from the transmission when towing the tractor. The tow lever, used in making the disconnect, is located at the left rear of the operator's platform.

A pedal located at the front left of the operator's platform, is used for "inching" the tractor or for emergency stops. It is not necessary to use the "inching" pedal for normal shifting. However, the pedal must be depressed to actuate the starter safety switch when starting the engine.

4020 transmission-hydraulic systems in tractors with Power Shift have two micronic oil filter assemblies to assure clean oil at all times.

An oil cooler keeps the transmission oil temperature at a satisfactory level.

DIFFERENTIAL AND FINAL DRIVE

A differential with spiral bevel ring gear and pinion is used in the tractor. A planetary gear assembly for final drive provides the final gear reduction in the drive gear train. This design reduces strain on the transmission gear train.

A differential lock is available as optional equipment on 4020 tractors, Serial No. 91000, and after. This device enables the operator to lock the differential, causing both rear wheels to turn at the same speed, facilitating operation in unusual conditions.

POWER TAKE-OFF (PTO) AND BELT PULLEY

Tractors are available without power take-off, with straight 1000 rpm power take-off, or 1000 rpm front and selective 540 or 1000 rpm rear power take-off. The front PTO operates at 1000 rpm only.

On 4020 Tractors, the PTO clutch operating lever is located at the right of the control support. On 4010 Tractors the lever is at the left of the support.

A belt pulley is available for mounting on the rear PTO shaft. The pulley is 12 inches in diameter with 3025 fpm belt speed at 1900 rpm rated engine speed.

Detailed instructions for using the PTO and belt pulley are included in Sections 160 and 170 of this manual.

DRAWBAR

Tractors can be purchased with regular or wide-swing drawbar. The regular drawbar is used on tractors equipped with rear rockshaft and Universal 3-Point Hitch. The wide-swing drawbar is used on tractors which are not equipped with rear rockshaft and Universal 3-Point Hitch. Instructions for using the drawbar are included in Section 300 of this manual.

FRONT WHEEL ASSEMBLIES

The tractor may be equipped with a variety of front end assemblies. For the row-crop tractor these include Roll-O-Matic, double front wheels, wide adjustable front axle, and single front wheel. The standard tractor may be equipped with fixed or adjustable front axles. For detailed information, see Sections 210 and 220 of this manual.

REAR WHEELS

On both row-crop and standard tractors, rear wheel tread adjustment is made by a pinion (located in the wheel hub) which engages a rack on the axle. Extreme adjustments are made by changing the position of the rim and tire on the wheel. Row-crop tractors may be equipped with regular-length, long, or extra-long rear axles.

Some 4010 Row-Crop Tractors were furnished with power-adjusted rear wheels, which made it possible to change rear wheel tread by engine power without jacking up the tractor. See Section 220 of this manual.

Power-adjusted wheels are not available for 4020 Tractors.

HYDRAULIC SYSTEM

All tractors are equipped with a constant-running hydraulic pump as regular equipment. Mounted below and ahead of the radiator, it is driven at engine speed from the engine crankshaft. The hydraulic pump supplies oil under pressure for power steering, power brakes, rear rockshaft, and remote hydraulic cylinders.

The hydraulic system is constant pressure, closed center, and "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 selective control valves and one or two pairs of breakaway couplers.

The single selective control valve operates one remote hydraulic cylinder only. Two selective control valves permit use of two remote cylinders, which can be operated either separately or simultaneously. The cylinders may be either of the single-acting or double-acting type.

Tractors can be equipped with rear rockshaft and Universal 3-Point Hitch which utilize hydraulic power to control implements to best advantage in various soil conditions.

POWER BRAKES

The power brakes are operated by two pedals located at the right front of the operator's platform. The brakes can be applied independently or simultaneously. The brakes are of the disk type, operating in oil, and are hydraulically power activated. Hydraulic oil, under pressure, to operate the brakes is supplied by the main hydraulic pump.

The power brakes are so designed that if the supply of pressure oil should fail they would operate in much the same manner as conventional hydraulic brakes.

STEERING

Hydraulic power steering is regular equipment on all tractors. Movement of the steering wheel activates a steering valve which directs a flow of oil, under pressure, to the steering motor which turns the front wheels. In the event of power oil supply failure, the tractor can be steered manually.

SEATS

All 4020 Tractors are equipped with a deluxe seat which contains a steel compression spring and shock absorber to provide "Float-Ride" suspension. The deluxe seat is also equipped with a flexibly-mounted padded backrest and semi-circular foam padding which surrounds the operator.

4010 Tractors were equipped optionally with the deluxe seat or a regular seat cushioned by no-sag springs and foam padding.

Regular seats are not available on 4020 Tractors shipped from the factory.