

John Deere 3020 Row Crop Standard and Hi-Crop Tractors (Serial No. 123000-)



OPERATORS MANUAL

John Deere 3020 Row Crop Standard and Hi-Crop
Tractors (Serial No. 123000-)

OMR46012 Issue B9 English

**John Deere Waterloo Works
OMR46012 Issue B9**

LITHO IN U.S.A. (REVISED)
ENGLISH



TO THE PURCHASER

Your versatile new John Deere Tractor meets the exacting requirements of modern farming.

Operating ease and comfort, hydraulic power when and where you need it, the ability to match engine power and transmission speed to any job, outstanding economy and dependability, modern styling, and simplicity of lubrication and service are all special features of this great tractor.

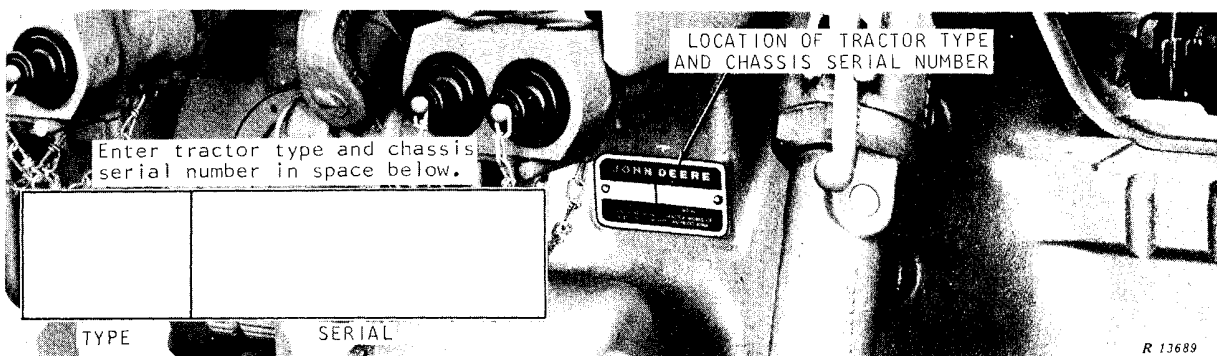
We are confident this modern tractor, combined with equally advanced John Deere tools and implements, will help you to farm better, easier, and more profitably.

At the time the tractor was delivered, the John Deere dealer discussed with you its safe operation and proper care. However, before putting the tractor to work, read this manual. It contains complete instructions for operating the tractor, caring for it, and taking full advantage of its many time- and labor-saving features. After reading the manual, keep it in a convenient place for quick and easy reference if questions arise concerning operation, lubrication, or service.

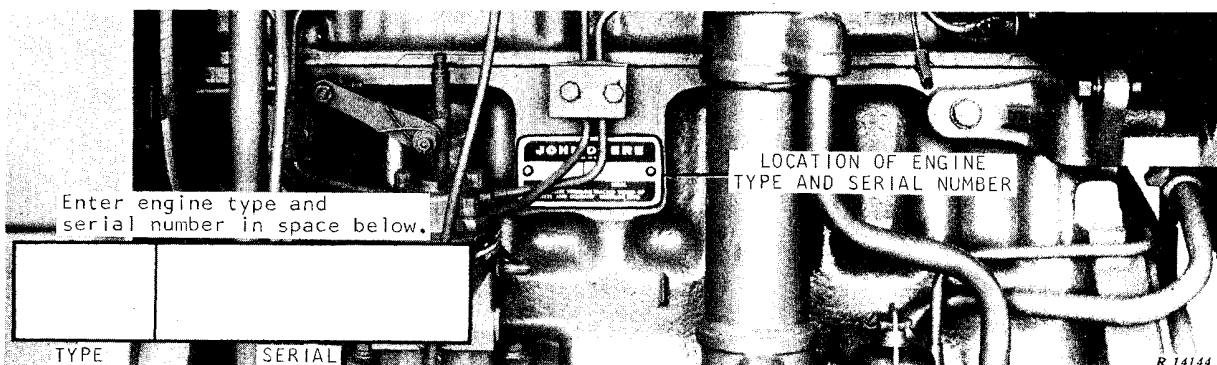
The warranty of this tractor appears on your copy of the purchase order which you should have received from your dealer when you purchased the tractor.

Your John Deere dealer wants to help you get the most value from your tractor. His skilled servicemen can handle every job efficiently. These men are trained in modern service methods; they have all necessary tools and equipment. If new parts are needed, only genuine John Deere parts will be installed. These parts are exact duplicates of the originals, made from the same patterns and of the same high-quality materials.

When in need of new parts, be prepared to furnish your dealer with the tractor type, complete tractor chassis serial number, engine type, and complete engine serial number. For ready reference, locate and record the above information in the spaces provided in the illustrations below.



Tractor Type and Chassis Serial Number

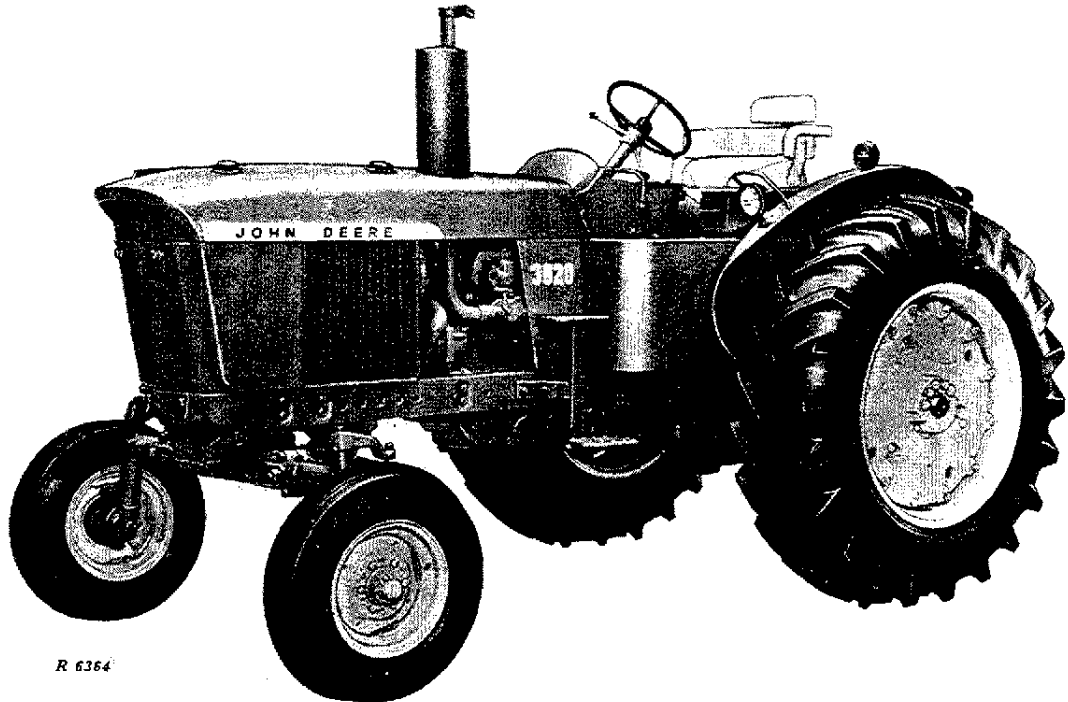


Engine Type and Serial Number



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R 6364

John Deere 3020 Standard Tractor with Gasoline Engine

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SPECIFICATIONS

HORSEPOWER (observed):*

	<i>Diesel</i>	<i>Gasoline</i>	<i>LP-Gas</i>
PTO (Syncro-Range Transmission) . .	70 h.p.	70 h.p.	70 h.p.
PTO (Power-Shift Transmission) . . .	65 h.p.	64 h.p.	64 h.p.
Drawbar (Power-Shift Transmission).	57 h.p.	55 h.p.	56 h.p.

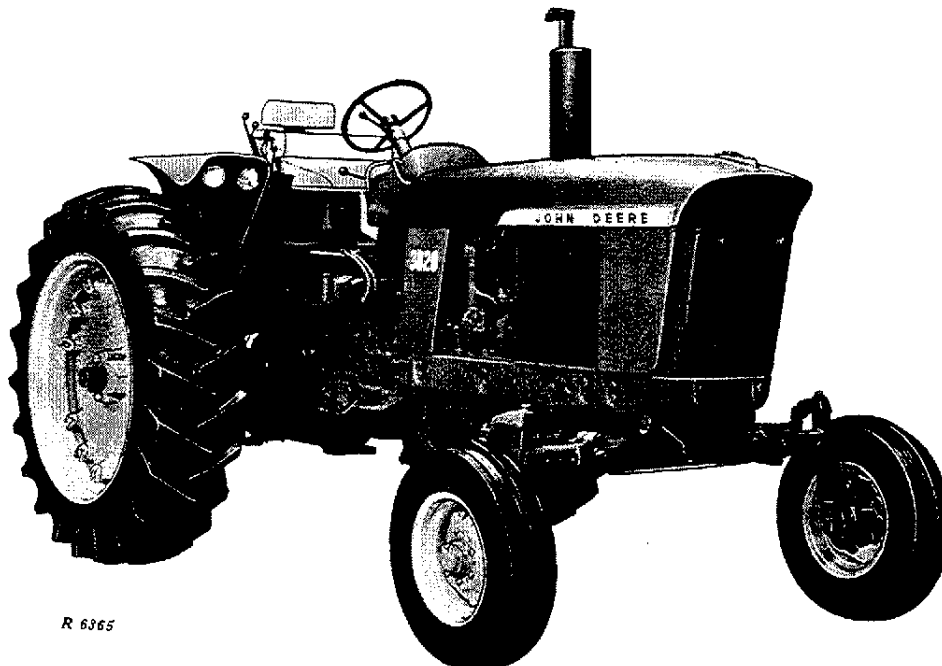
ENGINE:

Type	4-cylinder, in-line, valve-in-head		
Engine speeds:			
Normal slow idle.	800 rpm	800 rpm	800 rpm
Working range	1500 to 2500 rpm	1500 to 2500 rpm	1500 to 2500 rpm
Bore and stroke.	4-1/4 in. x 4-3/4 in.	4-1/4 in. x 4-1/4 in.	4-1/4 in. x 4-1/4 in.
Displacement.	270 cu. in.	241 cu. in.	241 cu. in.
Compression ratio	16.5 to 1	7.5 to 1	9.0 to 1
Firing order	1-3-4-2	1-3-4-2	1-3-4-2
Intake valve clearance.	0.018 in.	0.015 in.	0.015 in.
Exhaust valve clearance	0.018 in.	0.028 in. (hot)	0.028 in. (hot)
Injection pump timing	TDC		
Distributor timing (see page 64 for engine speed)		20° BTDC	25° BTDC
Distributor point gap.		0.022 in.	0.022 in.
Spark plug gap.		0.025 in.	0.015 in.

ELECTRICAL SYSTEM:

Electrical system voltage	12 volts	12 volts	12 volts
Batteries (see page 72)	Two (connected in series)	One	One

*Maximum observed horsepower at 2500 engine rpm (factory observed).



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John Deere 3020 Row-Crop Tractor with Gasoline Engine and Power Shift Transmission

COOLING SYSTEM

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

LUBRICATION SYSTEM Force-feed pressurized type with full-flow oil filter

CAPACITIES:

Fuel tank Diesel and gasoline-- 29 U.S. gals.
LP-Gas (80% full)-- 33.6 U.S. gals.
Crankcase Dry system-- 9 U.S. qts.
At service intervals-- 8 U.S. qts.
Transmission-hydraulic system (add approx. 4-1/2 U.S. gals. for Power Front-Wheel Drive):
Syncro-Range Dry system-- 11 U.S. gals.
At service intervals-- 8 U.S. gals.
Power Shift Dry system-- 14 U.S. gals.
At service intervals-- 11 U.S. gals.
Cooling system 19 U.S. qts.
Hi-crop final drive housings 1-3/4 U.S. qts.
Belt pulley 2-1/2 U.S. pints

SYNCRO-RANGE TRANSMISSION:

Type Syncro-Range, constant mesh
Gear selections 8 forward and 2 reverse
Shifting 4 stations, synchronized shifting within stations

POWER SHIFT TRANSMISSION:

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

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

POWER TAKE-OFF:

Type Independent PTO with front and mid power take-off. Stub shafts used for rear PTO speed conversion on dual speed PTO.

Speed (2100 engine rpm) Mid-1000 rpm
Dual speed rear-540 or 1000 rpm
Single speed rear-1000 rpm

HYDRAULIC SYSTEM:

Type Closed center, constant pressure. Includes power steering, power brakes, and implement control

Maximum pressure 2250 psi

BRAKES Hydraulically power actuated, disk-type, operating in oil

GROUND SPEEDS See page 13

FRONT TIRES**

Row-crop 6.00 - 16, 6-ply
Standard 7.50 - 16, 6-ply

REAR TIRES**

Row-crop 15.5 - 38, 6-ply
Standard 18.4 - 30, 6-ply

FRONT WHEEL TREAD See page 18

REAR WHEEL TREAD:

Regular and offset wheels See page 19
Double wheels See page 21

DIMENSIONS

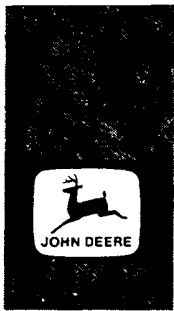
	Row-Crop	Standard
Wheel base	90 in.	81-1/2 or 92-3/4 in.
Over-all length	140 in.	140-1/4 in.
Over-all height	87-1/2 in.	88-3/8 in.
Height to steering wheel	77-1/8 in.	77-1/8 in.
Width (regular axle)	89-5/8 in.	89-5/8 in.
Turning radius	101 in.	111 in.

SHIPPING WEIGHT (With equipment for average field service, less fuel and ballast). Add 225 lbs. if tractor has Power Shift transmission. Add 550 lbs. if equipped with Power Front Wheel Drive:

	Row-Crop	Standard
Diesel	7610 lbs.	7560 lbs.
Gasoline	7395 lbs.	7345 lbs.
LP-Gas	7545 lbs.	7495 lbs.

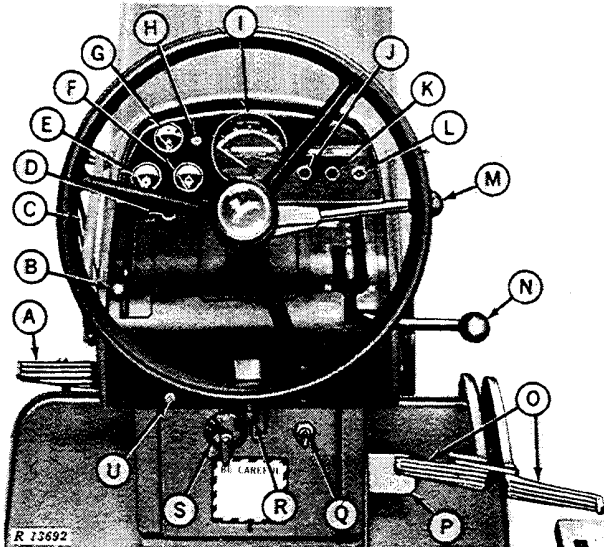
**Additional tires available for special purposes.

Specifications and design subject to change without notice.

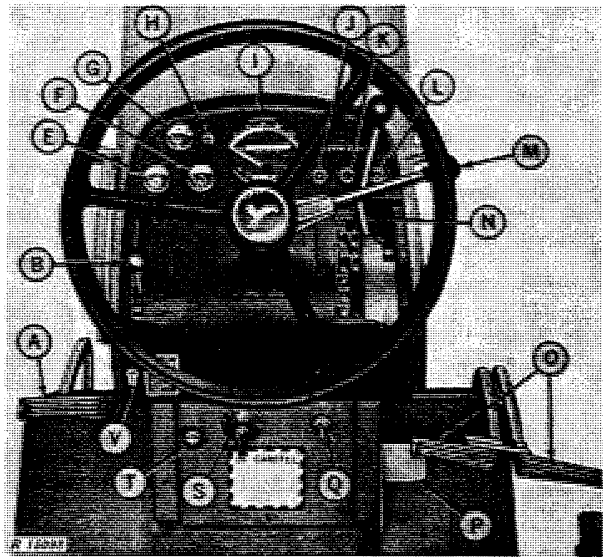


CONTROLS AND INSTRUMENTS

Before attempting to operate your new tractor, become familiar with the location and purpose of its controls and instruments. Additional information will be found on the page number following the control or instrument. World-wide graphic symbols are used to assist identification and operation.

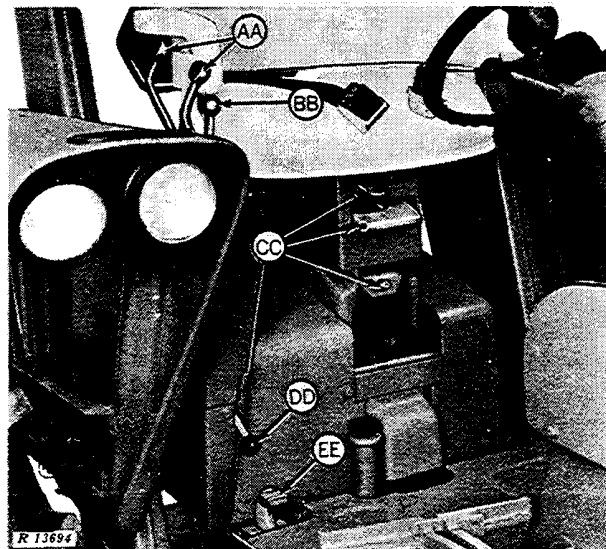


Tractor with Diesel Engine and Power Shift Transmission



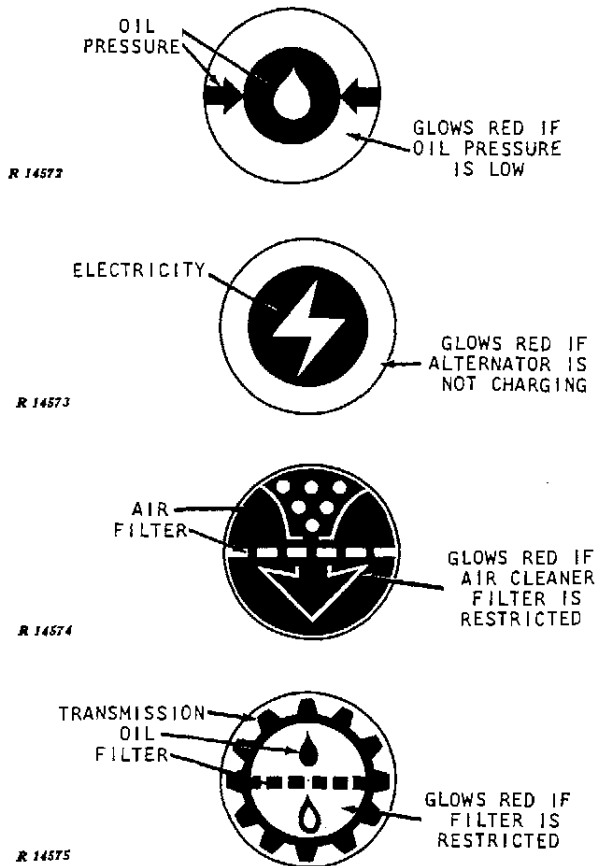
Tractor with Gasoline Engine and Syncro-Range Transmission

- A - Clutch Pedal (Syncro-Range Tractors, page 15)
- B - Inching Pedal (Power Shift Tractors, page 13)
- C - Power Take-Off Clutch Lever (page 41)
- D - Engine Disconnect Lever (Power Shift Tractors, page 9)
- E - Transmission Oil Filter Indicator Light (Power Shift Tractors, page 14)
- F - Transmission Oil Temperature Gauge (pages 14 and 15)
- G - Coolant Temperature Gauge
- H - Fuel Gauge
- I - Speed Indicator Knob (page 13)
- J - Speed-Hour Meter (pages 13 and 50)
- K - Alternator Indicator Light (pages 6 and 7)
- L - Air Cleaner Indicator Light (pages 6 and 7)
- M - Oil Pressure Indicator Light (pages 6 and 7)
- N - Hand Throttle (page 10)
- O - Shift Lever (Syncro-Range Tractors, page 15)
- P - Speed Selector (Power Shift Tractors, page 13)
- Q - Brake Pedals (page 17)
- R - Foot Throttle (page 10)
- S - Key Switch (pages 6, 7, and 11)
- T - Ether Starting Fluid Adapter (Diesel Tractors, page 8)
- U - Light Switch (page 25)
- V - Engine Choke Knob (Gasoline Tractors, page 7)
- W - Disconnect Lever Latch (Power Shift Tractors, page 9)
- X - Power Front Wheel Drive Operating Switch (page 16)

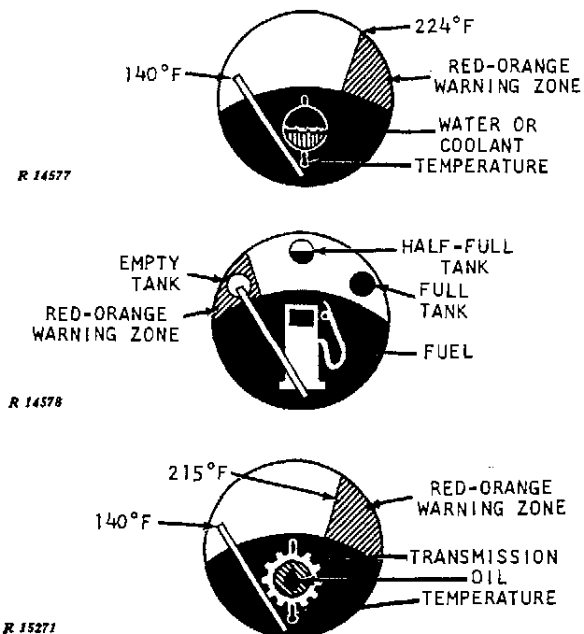


- AA - Remote Cylinder Operating Levers (page 36)
- BB - Rockshaft Control Lever (page 27)
- CC - Seat Controls (page 12)
- DD - Rockshaft Selector Lever (page 28)
- EE - Differential Lock Pedal (page 17)

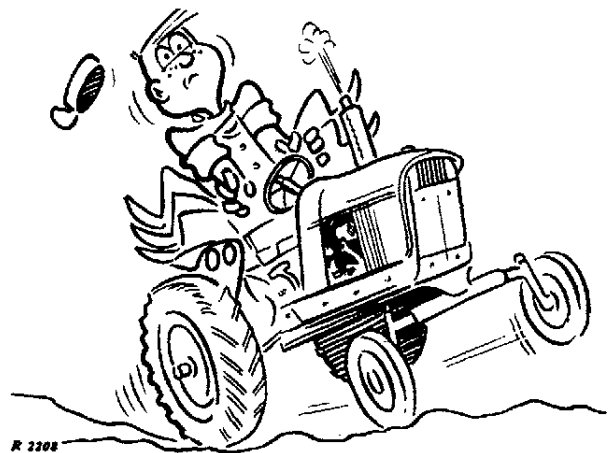
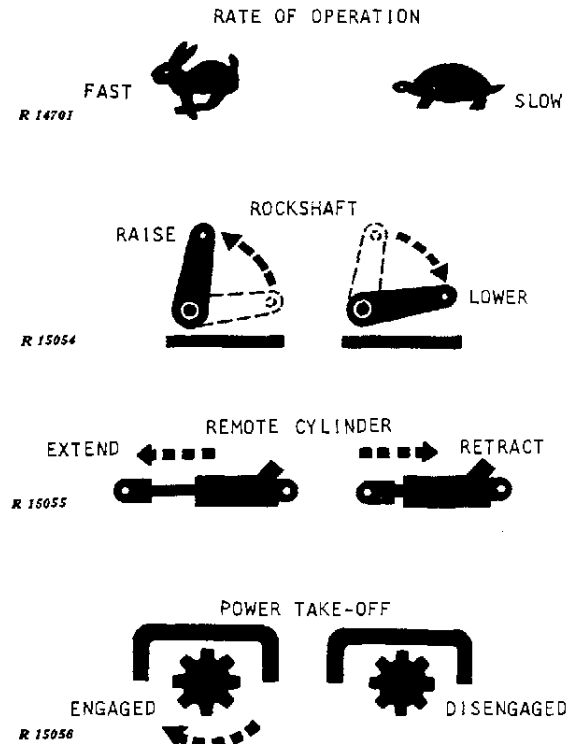
INDICATOR LIGHTS



GAUGES



CONTROL SYMBOLS



CAUTION: Fast driving causes many accidents. Couple the brake pedals together and always drive at a safe speed.



OPERATION

Complete instructions for operating your tractor safely and efficiently are given on the following pages. By following these directions carefully, you can be sure that you are taking full advantage of the many features built into your tractor.

OPERATING THE ENGINE

PRESTARTING CHECKS

Perform the following checks and services before starting the engine for the first time each day:

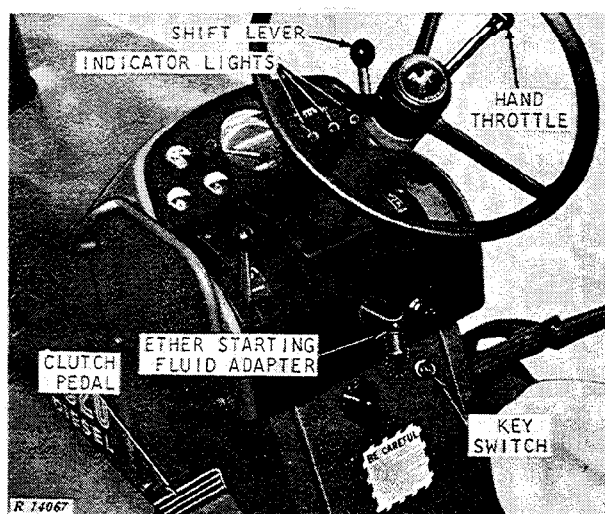
- (1) Check the engine crankcase oil level - see page 54.
- (2) Check the radiator coolant level - see page 54.
- (3) If tractor has a precleaner, check the collector bowl - see page 55.
- (4) If tractor has a fuel pump, check the sediment bowl - see page 55.
- (5) Grease the wide-swing drawbar rollers, Hi-Crop rear axles, and the Roll-O-Matic or wide front axle grease fittings - see page 55.
- (6) Grease the front wheel bearings if the tractor has been operated in extremely wet or muddy conditions - see page 55.

STARTING THE DIESEL ENGINE

NOTE: If the prevailing temperature is 40 degrees Fahrenheit or lower, it may be necessary to use a cold weather starting aid to start the engine (page 8).

Perform the prestarting checks listed above.

- (1) Make sure the fuel shut-off valve on the bottom of the fuel tank is open—see page 62.
- (2) See that the shift lever or the speed selector is in the "PARK" position. Depress the clutch pedal or the inching pedal.
- (3) **PLACE THE HAND THROTTLE IN THE 1200 RPM POSITION**, approximately one-third of its travel downward.
- (4) Turn the key switch clockwise to the first position. The alternator and oil pressure indicator lights should glow. Turning the key switch further to the start position should cause the air cleaner indicator light to glow. On Power Shift tractors the transmission oil filter indicator light should glow. If any light fails to glow, turn off the key switch and determine the cause.



Diesel Starting Controls

- (5) Turn the key switch all the way to the right to start the engine. Do not operate the starter for more than 30 seconds at a time. To do so may overheat the starter. If the engine does not start the first time, wait for a minute or two before trying again. If it does not start after four attempts, see "Troubleshooting."

If the key switch is released before the engine starts, wait until the starter and the engine stop before trying again. This will prevent possible damage to the starter.

Before the starter will operate, the shift lever or the speed selector lever must be in "PARK" or neutral.

- (6) After the engine starts, the indicator lights should go out. The transmission oil filter indicator light may continue to glow when the oil is cold. If any other light continues to glow after the engine has been running 10 seconds, stop the engine and determine the cause.

If the Power Shift engine disconnect clutch was disengaged, engage the clutch immediately after starting the engine. This will prevent damage to the tractor.

STARTING THE GASOLINE ENGINE

Perform the Prestarting checks on page 6.

(1) Make sure the fuel shut-off valve on the bottom of the fuel tank is open—see page 62.

(2) See that the shift lever or the speed selector is in "PARK" position. Depress the clutch pedal or the inching pedal.

(3) Move the hand throttle all the way up.

(4) PULL THE ENGINE CHOKE KNOB OUT.

NOTE: At low temperatures it may be necessary to use a cold weather starting aid (page 8).

(5) Turn the key switch clockwise to the first position. The alternator and oil pressure indicator lights should glow. Turning the key switch further to the start position should cause the air cleaner indicator light to glow. On Power Shift tractors the transmission oil filter indicator light should glow. If any light fails to glow, turn off the key switch and determine the cause.

(6) Turn the key switch all the way to the right to start the engine. If the engine is warm, push the choke knob in after a few revolutions. To prevent overheating the starter, do not operate the starter for more than 30 seconds at a time. Then wait a minute or two before trying again. If the engine does not start after four such attempts, see "Troubleshooting."

If the key switch is released before the engine starts, wait until the starter and the engine stop before trying again. This will prevent possible damage to the starter.

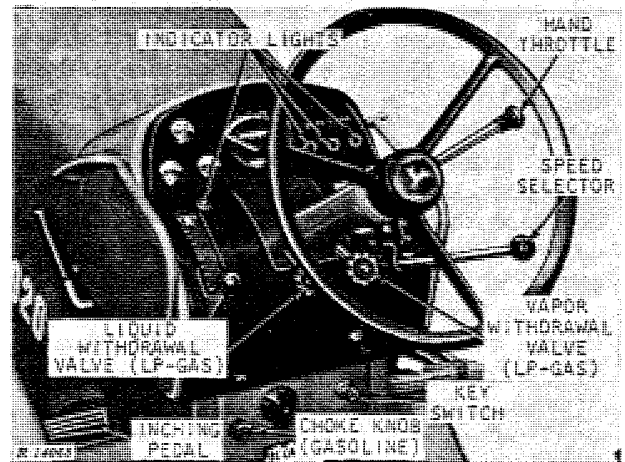
Before the starter will operate, the shift lever or the speed selector lever must be in "PARK" or neutral.

(7) If the engine is cold, push the choke knob in after the engine starts. In cold weather, it may be necessary to leave the choke partially on for the first few minutes.

(8) After the engine starts, the indicator lights should go out. The transmission oil filter indicator light may continue to glow when the oil is cold. If any other light continues to glow after the engine has been running 10 seconds, stop the engine and determine the cause.

If the Power Shift engine disconnect clutch was disengaged, engage the clutch immediately after starting the engine. This will prevent damage to the tractor.

STARTING THE LP-GAS ENGINE



Starting Controls on Gasoline and LP-Gas Tractors

Perform the Prestarting checks on page 6.

(1) See that the shift lever or the speed selector is in "PARK" position. Depress the clutch pedal or the inching pedal.

(2) Move the hand throttle all the way up to the SLOW IDLE POSITION. Depress the starting pedal (rear pedal of the combination foot throttle and starting pedal illustrated on page 11). This closes the carburetor throttle and prevents hard starting that would occur if the carburetor throttle were open.

(3) Open the VAPOR withdrawal valve slowly. If the valve is opened too fast, it may cause the excess flow valve (inside the withdrawal valve) to close and prevent normal flow of vapor. If this happens, close the vapor withdrawal valve and open it more slowly. Engine will not start on liquid fuel.

(4) Turn the key switch clockwise to the first position. The alternator and oil pressure indicator lights should glow. Turning the key switch further to the start position should cause the air cleaner indicator light to glow. On Power Shift tractors the transmission oil filter indicator light should glow. If any light fails to glow, turn off the key switch and determine the cause.

(5) Turn the key switch all the way to the right to start the engine. Before the starter will operate, the shift lever or the speed selector must be in "PARK" or neutral.

(6) Do not move hand throttle from the slow idle position until the engine fires regularly. If the temperature is 20° F. or lower, it may be necessary to slowly move the hand throttle downward AFTER the engine has fired. Release the starter when it no longer is turning the engine.

Operating the starter for more than 30 seconds at a time may overheat the starter. If the engine does not start the first time, wait for a minute or two before trying it again. If it does not start after four attempts, see "Troubleshooting."

If the key switch is released before the engine starts, wait until the starter and the engine stop before trying again. This will prevent possible damage to the starter.

(7) After the engine starts, the indicator lights should go out. The transmission oil filter indicator light may continue to glow when the oil is cold. If any other light continues to glow after the engine has been running for 10 seconds, stop the engine and determine the cause.

If the Power Shift engine disconnect clutch was disengaged, engage the clutch immediately after starting the engine. This will prevent damage to the tractor.

(8) Operate the engine on vapor until the cooling system is warm. Then slowly open the liquid withdrawal valve and close the vapor valve. Opening the liquid withdrawal valve too fast may cause the excess flow valve to close and prevent normal flow of liquid. If this happens, close the withdrawal valve and open it more slowly.



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CAUTION: Before starting the tractor engine, be sure there is plenty of ventilation. Never operate the tractor in a shed or garage.

COLD WEATHER STARTING AIDS

For cold weather starting, the diesel tractor is equipped with an ether starting fluid adapter. The Power Shift transmission tractor is equipped with an engine disconnect lever. Other starting aids are available from your John Deere dealer.

These aids are effective at low temperatures only when the engine is otherwise operating satisfactorily. They will not correct such deficiencies as low battery charge, crankcase oil of heavy viscosity, and high electrical resistance which may prevent the engine from starting.

ETHER STARTING FLUID ADAPTER (Diesel Tractors)

The diesel tractor is equipped with this adapter which is used to inject atomized starting fluid into the engine air intake system. Pressurized cans of starting fluid are available from your John Deere dealer.

To use the can of starting fluid, remove the safety cap and plastic spray button from the can. Remove the cap from the adapter and position the can under the adapter.



Injecting Starting Fluid

To inject a "shot" of starting fluid, momentarily push up on the can.

IMPORTANT: To avoid damage, turn engine with starter one or two revolutions before injecting starting fluid. Inject starting fluid only while the engine is turning.

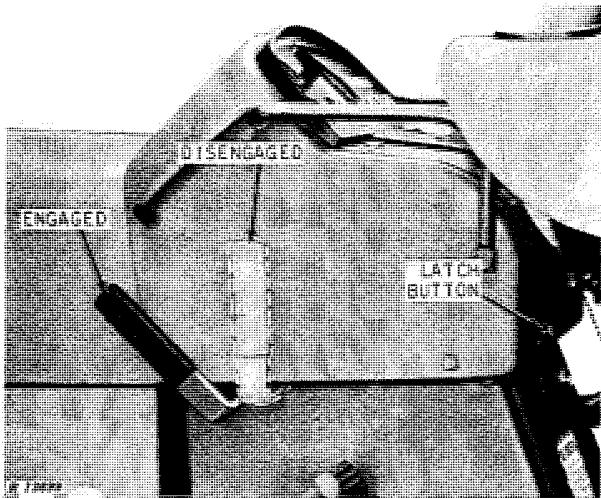
Relax pressure on the can between "shots" of starting fluid. Stop injecting fluid after the engine starts. If the engine begins to die during the first few minutes of operation, inject another "shot" of fluid. When the engine is operating satisfactorily, remove the can from the adapter and replace the safety cap on the can.

Be sure to install the cap on the adapter when it is not in use. This will prevent dust from being drawn into the engine.

Store starting fluid cans where they will not be subject to extreme cold or warm temperatures. For best results, store fluid at room temperature.

CAUTION: Ether starting fluid is highly flammable.

ENGINE DISCONNECT LEVER (Power Shift Tractors)



Engine Disconnect Lever

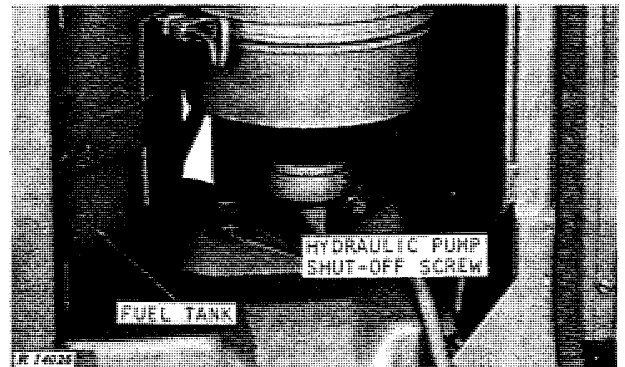
During cold weather, the starter speed on Power Shift tractors may be increased by disengaging the engine disconnect lever so that the transmission will not turn. To do so, pull the lever rearward until it is latched in the disengaged position.

Immediately after starting the engine, engage the lever by pulling it slightly rearward. Push in on the latch button and allow the lever to move forward to the engaged position.

IMPORTANT: Operating the engine with the engine disconnect lever disengaged will damage the tractor. Be sure to engage it as soon as the engine starts. Never attempt to start a Power Shift tractor by towing or pushing.

SHUTTING OFF HYDRAULIC PUMP

If the tractor has a hydraulic pump shut-off screw, the starter speed may be increased dur-



Hydraulic Pump Shut-Off Screw

ing cold weather by shutting off the hydraulic pump so it will not build up pressure. This will also prevent inadvertent operation of the Power Front Wheel Drive.

Turn the shut-off screw in (clockwise) one turn with a screwdriver. Then turn the screw in by hand until resistance is felt. Turn the screw in one more turn. After the engine has started, use a screwdriver to back the shut-off screw all the way out (turn it counterclockwise). The pump will now build up pressure.

NOTE: Oil will leak past the shut-off screw if it is not backed all the way out against the internal stop.

CRANKCASE OIL AND TANK-TYPE COOLANT HEATERS

To facilitate cold weather starting, a 240-watt, 115-volt electrical crankcase oil heater may be installed in the engine oil pan at the lower front right-hand corner.

A thermostatically controlled tank-type coolant heater (available from your dealer) will improve cold weather starting. This attachment will keep the coolant warm, reducing oil drag and shortening the engine warm-up period.

CAUTION: To avoid shock or hazardous operation, always use a three wire heavy-duty electrical cord equipped with 3-wire connectors. If a 2- to 3-contact adapter is used at the wall receptacle, always connect the green wire to a good ground.

ADDITIONAL BATTERIES

Cold weather starting can be made easier by connecting an additional 12-volt battery in parallel with the battery or batteries on the tractor.

CAUTION: Gas given off by batteries is explosive. To avoid injury or battery damage, avoid sparks near the batteries.

10 Operation - Engine

To avoid sparks, make sure all electrical switches or accessories are turned off and make the last connection or the first disconnection at some point away from the batteries.

Connect a jumper cable to the POSITIVE (+) post of a 12-volt booster battery and to the POSITIVE (+) post of the tractor battery that is connected to the starter. Connect one end of the other jumper cable to the negative post of the booster battery and to a good ground on the tractor frame away from the battery. Never connect jumper cables to pipes or thin sheet metal.

NOTE: Reversed polarity booster battery connections may damage the alternator or electrical wiring.

See your John Deere dealer for additional booster battery information.

TRACTOR WARM-UP PERIOD

Always be sure the tractor is warmed up properly before operating under a full load.

A good way to do this is first to idle the engine at about 1500 rpm for 5 minutes and then operate it at about 1900 rpm for another 5 minutes.

It is good practice to operate the tractor for the first 30 minutes in a lower gear than is normally required for the load. This gives the oil a chance to circulate freely and prevents undue wear on engine or transmission parts.

ENGINE IDLING

Avoid unnecessary engine idling. Prolonged engine idling may cause the engine coolant temperature to fall below its normal range. This in turn causes crankcase oil dilution, due to incomplete fuel combustion, and permits formation of gummy deposits on valves, pistons, and piston rings. It also promotes rapid accumulation of engine sludge and unburned fuel in the exhaust system. When the tractor is to remain idle for a considerable length of time, stop the engine.

ENGINE SPEEDS

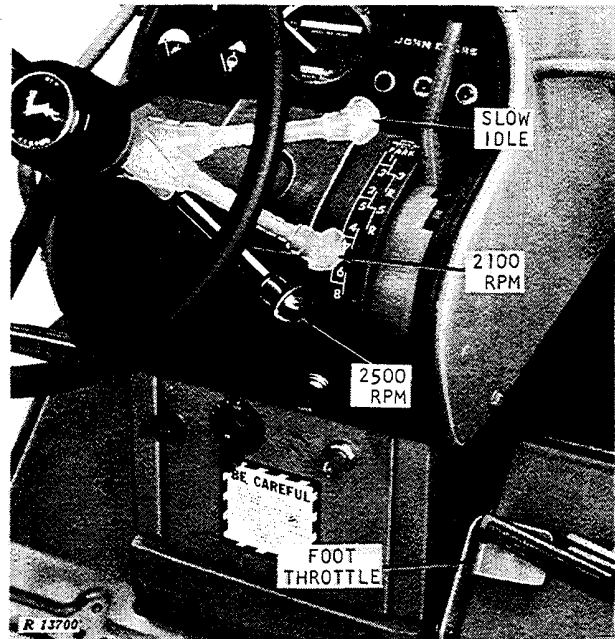
The tractor engine is designed to operate at working speeds ranging from 1500 to 2500 rpm.

The engine can be operated at any speed in the working range to meet various operating conditions. Operate the engine at 2100 rpm to obtain the ASAE standard PTO speeds.

Normal slow idle is 800 rpm.

To check engine speeds, see page 59.

USING HAND THROTTLE



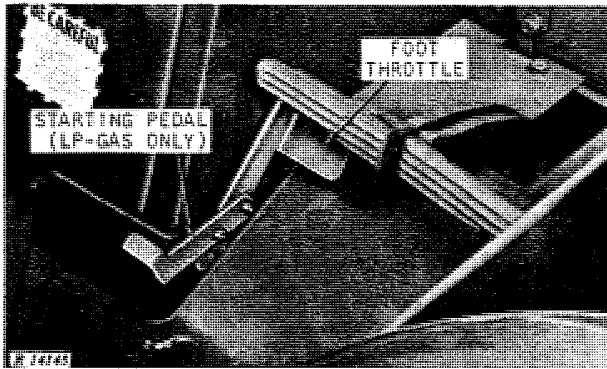
Range of Hand Throttle Positions

Use the hand throttle to select slow idle or any of the variable governed speeds from 1500 to 2500 rpm.

Push the throttle up to obtain the slow idle speed of 800 rpm. To obtain the 2100 rpm load speed, pull the throttle downward to the first stop. Placing the throttle halfway between slow idle and 2100 rpm gives the 1500 rpm speed. Engine speeds between 1500 and 2100 rpm may be selected by moving the lever between these two positions.

To obtain working speeds above 2100 rpm, pull out on the knob at the end of the hand throttle. With the knob pulled out, pull the throttle downward as far as it will go. This is the 2500 rpm load speed position. Engine speeds between 2100 and 2500 rpm may be selected by moving the lever between these two positions.

USING FOOT THROTTLE

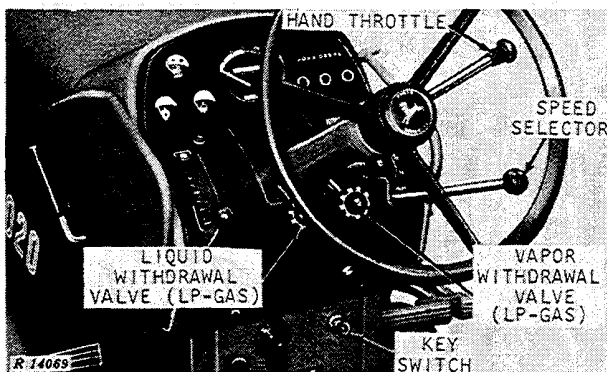


Operating the Foot Throttle

The foot throttle is used to raise engine speed momentarily. When the foot throttle is pushed all the way downward, the engine operates at 2500 rpm load speed.

LP-Gas tractors have a combination foot throttle and starting pedal. Depress the front pedal to increase engine speed or depress the rear starting pedal to close the carburetor throttle when starting the engine.

STOPPING THE ENGINE



Stopping Controls

Place the shift lever or speed selector in "PARK" and allow the engine to idle a few minutes. Sudden stopping of a hot engine may allow some parts to overheat momentarily and cause possible damage.

DIESEL ENGINES

Turn the key switch counterclockwise to the off position to stop the engine.

GASOLINE ENGINES

With the engine running at approximately 1200 rpm, turn the key switch off to stop the gasoline engine.

LP-GAS ENGINES

Close the withdrawal valves and let the engine run until ALL the fuel is exhausted from the lines and the engine stops. Then, turn the key switch off.

IMPORTANT: The engine will not start on liquid fuel. Never leave the tractor with the withdrawal valves open. The fuel system can be damaged if liquid fuel is left in the fuel lines with the withdrawal valves closed.

ALL ENGINES

After stopping the engine, remove the key from the switch to prevent tampering and unauthorized operation. Removing the key also prevents the switch from being accidentally left on in either the on (clockwise) or the accessory (counterclockwise) position and causing battery discharge.

Before dismantling, be sure all equipment is lowered to the ground, the light switch and other accessory switches are off, and the transmission is in the "PARK" position.

BREAKING IN THE ENGINE

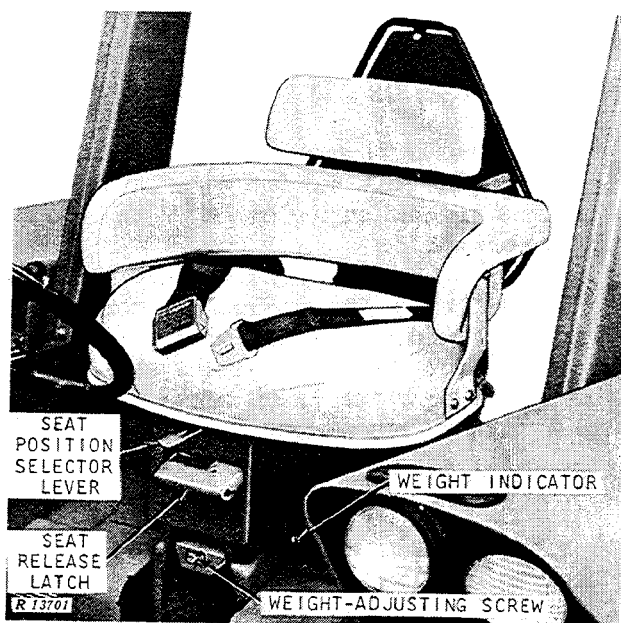
NOTE: If the coolant temperature rises above the warning range, operate in a lower gear to reduce the load on the engine. Be sure to follow the special break-in lubrication instructions given on page 50.

With the following exceptions, the engine is ready for normal operation:

During the first 20 hours, it is not recommended to use the foot throttle or to place the hand throttle in speeds above the 2100 rpm load speed position (page 10). To facilitate break-in, avoid prolonged periods of engine idling, for the first 100 hours of service.

OPERATING THE TRACTOR

SEAT



Seat Controls

The deluxe foam-padded suspension seat contains a steel compression spring and shock absorber to provide "Float-Ride" comfort.

Use only warm water and a mild soap to clean the seat cushions. Never use solvents.

MOVING SEAT TO UPPER REAR POSITION

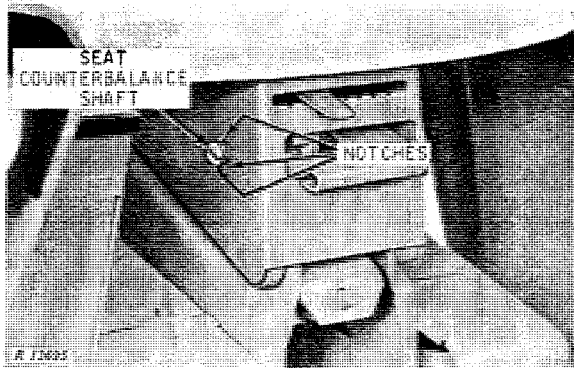
To move the seat up and back, stand up and lift the seat release latch. A counterbalance spring will move the seat to the upper rear position. Sit down to return the seat to the normal preset operating position.

ADJUSTING FOR HEIGHT AND WEIGHT OF OPERATOR

The seat can be adjusted to the height of the operator. With the seat in the upper rear position, shift the seat position selector lever between "short" and "tall" until the controls can be operated comfortably when you are seated.

The tension of the steel compression spring can be adjusted to conform to your weight. This enables the seat to "float" when you are traveling over rough ground. To make this adjustment, turn the weight-adjusting screw clockwise or counterclockwise until the indicator in the left-hand side of the seat conforms to your weight.

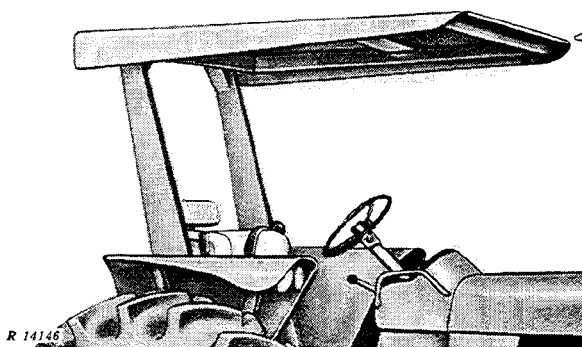
ADJUSTING COUNTERBALANCE SPRING



Seat Counterbalance Shaft

If the seat does not move fully to the rear when unlatched, adjust the counterbalance spring. With the seat in the upper rear position, insert screwdriver in the counterbalance shaft slot. Push in to unlatch the shaft and turn the shaft counterclockwise. Align the latch in the end of the shaft with one of the pair of notches. Pull the screwdriver outward so the latch will engage the notches.

ROLL-GARD, SEAT BELT, AND CANOPY



Roll-Gard, Seat Belt, and Canopy

A protective Roll-Gard with seat belt may be ordered as special equipment for your tractor. A canopy that fits on top of the Roll-Gard is also available. See page 77 for additional information.

CAUTION: Under almost all operating conditions:

1. Use of the seat belt with the optional John Deere Roll-Gard is recommended.
2. Use of a seat belt without roll-over protective equipment is not recommended.

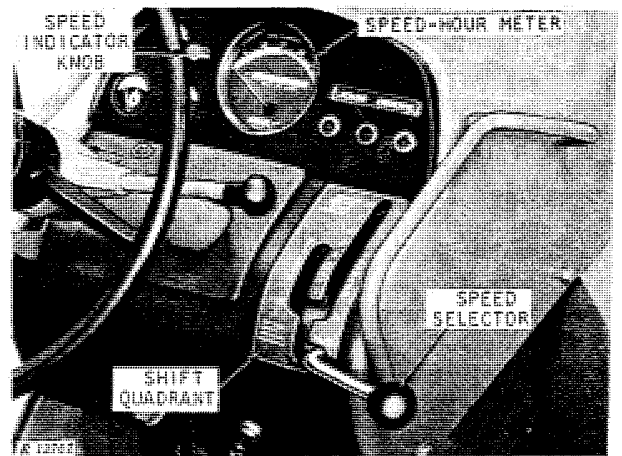
SELECTING GROUND SPEED

Both transmissions provide eight forward speeds for each of the throttle positions that may be used. The Syncro-Range transmission has two reverse speeds, and the Power Shift transmission has four. These combinations enable the operator to balance speed and power for maximum economy and allow him flexibility to meet varying working conditions. For example, at a given ground speed the operator may choose to work in a low gear at high engine speed for maximum reserve power or in a higher gear at a lower engine speed for maximum fuel economy.

Examples of the ground speeds at which the tractor will travel are shown below. Engine working speeds may be varied between 1500 rpm and 2500 rpm. Tractor ground speeds shown in the chart are only for engine speeds of 1500, 2100, and 2500 rpm.

Turn the speed indicator knob on the instrument panel until the gear selected shows on the speed indicator. The speed-hour meter needle will now indicate the tractor ground speed in miles per hour.

Avoid overloading the tractor. When this occurs, operate in a lower gear. If moving the throttle slightly will change engine speed, the engine is not overloaded or lugging. Overloading causes undue strain on parts eventually resulting in poor operation and unnecessary repair expense.



Speed Indicator Knob and Speed Selector

POWER SHIFT TRANSMISSION

SHIFTING

The Power Shift transmission can be shifted "on the go" or when the tractor is stopped by moving the speed selector to the desired gear. It is not necessary to use the inching pedal when starting out or when shifting.

To move the tractor forward, move the speed selector from neutral to the desired gear in the right-hand or forward side of the quadrant. Progressive shifting (one gear at a time) will result in smoother speed change.

TRACTOR GROUND SPEEDS IN MILES PER HOUR

NOTE: The ground speeds shown in the chart below are for Row-Crop tractors with 15.5-38 rear tires that have a loaded radius of 28.5 inches. Standard and Hi-Crop tractors have similar ground speeds.

Gear	1500 Rpm		*2100 Rpm		2500 Rpm	
	Syncro-Range	Power Shift	Syncro-Range	Power Shift	Syncro-Range	Power Shift
1st	1.2	1.1	1.7	1.6	2.0	1.9
2nd	1.9	1.6	2.6	2.2	3.1	2.6
3rd	2.4	2.5	3.4	3.4	4.1	4.1
4th	3.1	3.2	4.4	4.4	5.2	5.3
5th	3.8	4.1	5.4	5.7	6.4	6.8
6th	5.1	5.3	7.2	7.4	8.6	8.8
7th	6.4	7.0	9.0	9.8	10.7	11.7
8th	10.5	11.7	14.7	16.4	17.6	19.5
1st reverse	2.4	1.3	3.3	1.8	...	...
2nd reverse	3.7	1.8	5.2	2.6	...	...
3rd reverse	...	2.9	...	4.0	...	...
4th reverse	...	3.7	...	5.2	...	...

**2100 engine rpm gives the ASAE standard PTO speed. Some PTO-driven implements are operated at other speeds. See the implement operator's manual for detailed instructions.*



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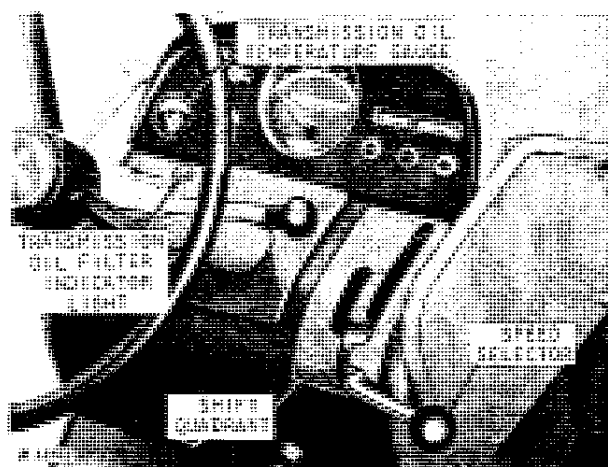
14 Operation - Tractor

To reverse the tractor, move the speed selector rearward progressively (one gear at a time) to neutral. Then, move the lever to first gear in the left-hand or reverse side of the quadrant. A hand rail beside the speed selector may be used as an aid to shifting when traveling over rough ground.

Use the inching pedal when making emergency stops, when hitching to an implement, or whenever slower clutch engagement is required.

Reduce engine speed prior to making sudden extreme speed changes.

OPERATION



Transmission Instruments and Speed Selector

When operating a tractor with Power Shift transmission, check the transmission oil temperature gauge and the transmission oil filter indicator light for satisfactory transmission operation.

If the indicator hand on the temperature gauge goes into the red zone, stop the tractor and clean all dirt and trash from the grille screens and the transmission hydraulic oil cooler core. See page 70. Also check for proper transmission-hydraulic oil level. If necessary, fill the system to the proper level. See page 57. If this does not correct the difficulty, call your John Deere dealer. Do not operate the tractor when the temperature indicator hand is in the red zone.

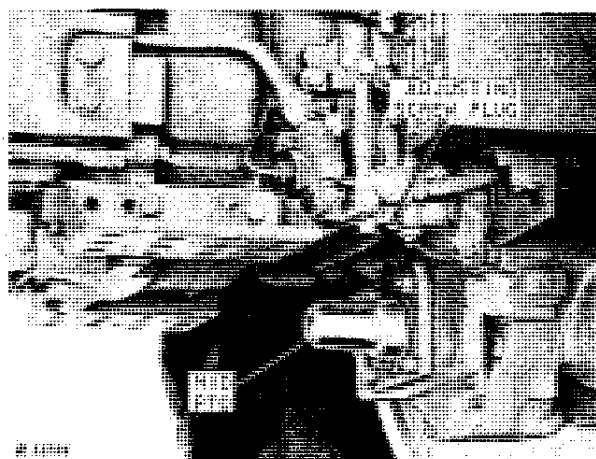
Should the transmission oil filter indicator light flicker on and off when using a hydraulic function at engine speeds above 2200 rpm, change

the transmission oil filter element (front element). Under normal conditions, change the filter at the next refueling and servicing. The amount of safe operating time with the light flickering depends on how fast the filter is clogging.

Change the filter IMMEDIATELY if any of the following symptoms are noted: the indicator lamp glows continuously, high transmission oil temperature, slipping of the transmission, or slow hydraulic function response particularly with single acting cylinders. DO NOT allow the transmission to slip.

SHIFT ADJUSTMENT

The transmission speed-of-shift may be adjusted for rapid shift or for slow, smooth shift. When pulling a heavy load, such as a plow, adjust for a rapid shift to prevent the tractor from stopping while shifting. When pulling a light load, such as a mower, adjust for a slow smooth shift.



Speed-of-Shift Adjusting Screw Plug

To adjust the speed-of-shift, stop the engine and remove the adjusting screw plug at the bottom of the valve housing on the left-hand side of the tractor. With a screwdriver, turn the adjusting screw in (clockwise) to slow down the shifting. To speed up the shifting for heavy loads turn the adjusting screw out. Turn the adjusting screw one-half turn at a time until the desired speed-of-shift is obtained.

Install the adjusting screw plug to prevent oil leakage.

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