

# John Deere 3010 Row-Crop and Standard Tractors



JOHN DEERE

## OPERATORS MANUAL

John Deere 3010 Row-Crop and  
Standard Tractors

OMR32385 I5 English

OMR32385 I5

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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 service policy which you received with your new tractor certifies that the tractor was properly inspected and prepared for delivery by your John Deere dealer. Keep this policy in a safe place and present it to the dealer whenever services which it authorizes are required.

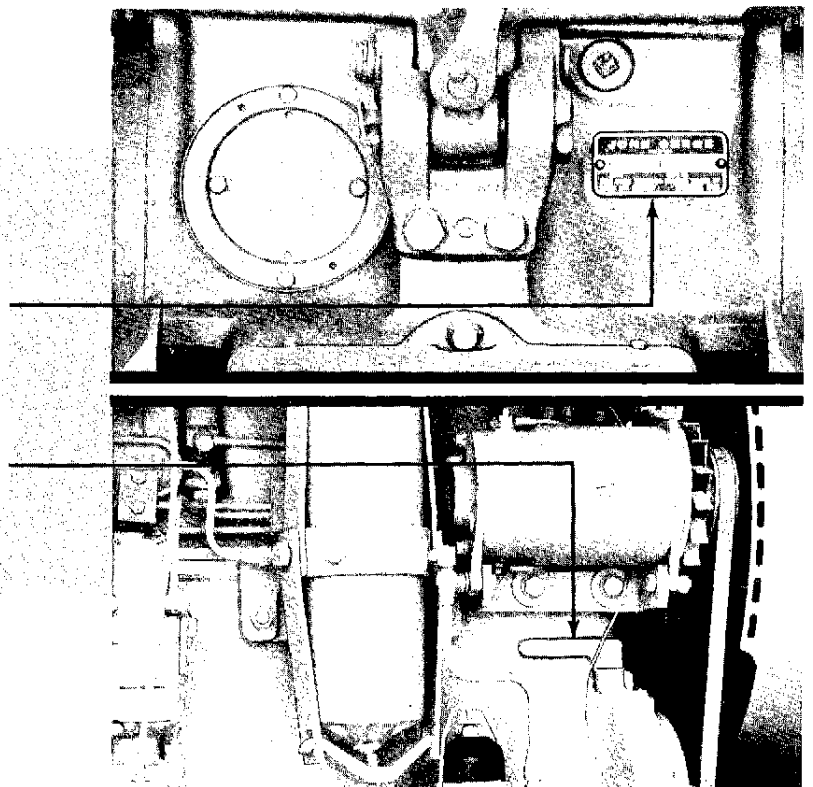
Your John Deere dealer wants to help you get the most value from your tractor. His skilled servicemen can handle every job efficiently. These men are trained in modern service methods; they have all necessary tools and equipment. If new parts are needed, only genuine John Deere parts will be installed.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

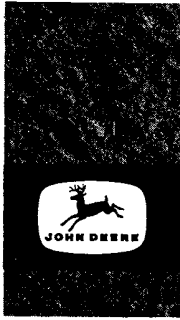
When in need of new parts, be prepared to furnish your dealer with the engine serial number, the tractor chassis serial number, and the tractor model number. The location of the serial numbers is illustrated below. For ready reference, record the numbers in the spaces provided.

**FILL IN THESE SPACES**

**CHASSIS SERIAL NUMBER**

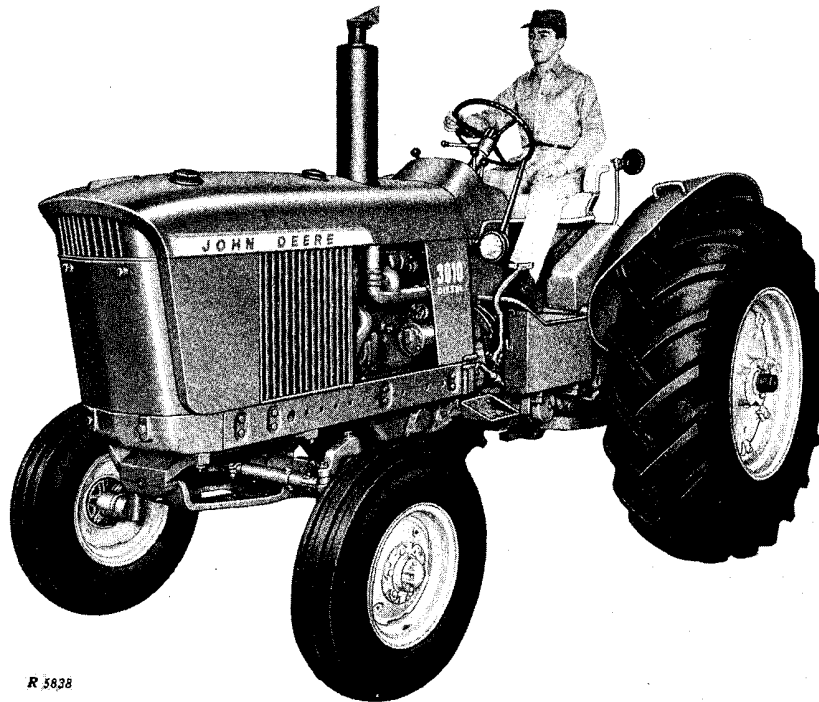
**ENGINE SERIAL NUMBER**





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R 5638

*John Deere 3010 Standard Diesel Tractor*

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# specifications

## HORSE POWER: \*

	Diesel	Gasoline	LP-Gas
PTO .....	59.44 h.p.	55.60 h.p.	55.39 h.p.
Drawbar .....	54.54 h.p.	52.00 h.p.	50.25 h.p.

## ENGINE:

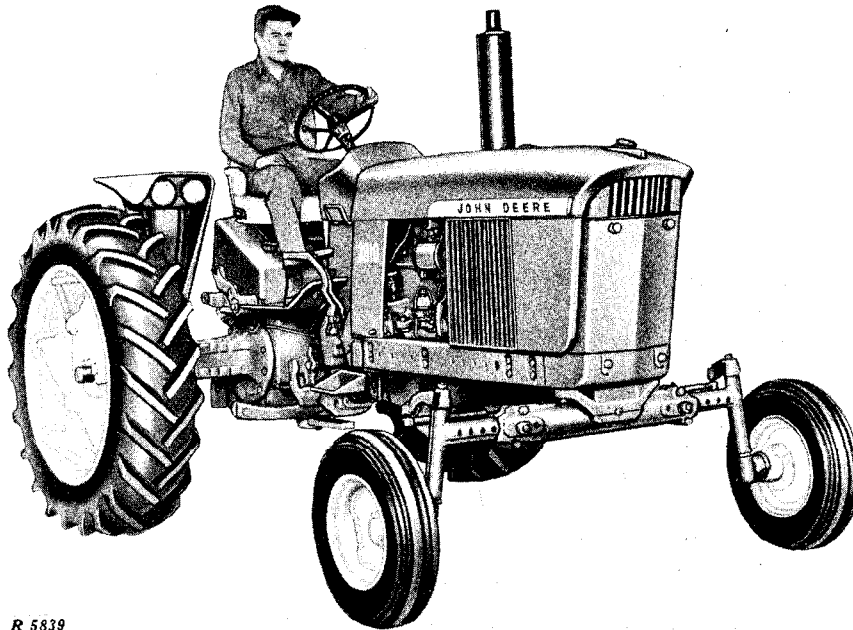
Type .....	4-cylinder, in-line, valve-in-head		
Engine speeds:			
Idle for engine shutoff .....	.....	420 rpm	500 rpm
Normal slow idle .....	600 rpm	650 rpm	650 rpm
Working range .....	1500 to 2200 rpm	1500 to 2200 rpm	1500 to 2200 rpm
Maximum transport speed .....	2500 rpm	2500 rpm	2500 rpm
Bore and stroke .....	4-1/8 in. x 4-3/4 in.	4 in. x 4 in.	4 in. x 4 in.
Displacement .....	254 cu. in.	201 cu. in.	201 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.	0.028 in.
Injection pump timing .....	10° BTDC	.....	.....
Distributor timing .....	.....	20° BTDC	25° BTDC
Distributor point gap .....	.....	0.022 in.	0.022 in.
Spark plug gap .....	.....	0.025 in.	0.015 in.

## ELECTRICAL SYSTEM:

	Diesel	Gasoline	LP-Gas
Starter and generator voltage .....	24 volts	12 volts	12 volts
Lights and accessory voltage .....	12 volts	12 volts	12 volts
12-volt battery, 78-plate, 75 amp-hour .....	Two (connected in series)	One	One

\*Maximum observed horsepower at 2200 engine rpm (Nebraska Test Nos. 762 for diesel, 763 for gasoline, 764 for LP-Gas)

Specifications and design subject to change without notice.



R 5839

John Deere 3010 Row-Crop Gasoline Tractor (Adjustable Front Axle)

**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) 25 U.S. gals.

**Crankcase:**

When lubrication system is dry . . . . . 9 U.S. qts.

At service intervals . . . . . 8 U.S. qts.

**Hydraulic system:**

When system is dry . . . . . 11 U.S. gals.

At service intervals . . . . . 9-1/2 U.S. gals.

Air cleaner . . . . . Diesel—4 U.S. pints  
Gasoline, LP-Gas—2-1/4 U.S. pints

Cooling system . . . . . 16 U.S. qts.

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

**TRANSMISSION:**

Type . . . . . Syncro-Range, constant mesh

Gear selections . . . . . 8 forward and 3 reverse

Shifting . . . . . 4 stations, synchronized shifting within stations

**POWER TAKE-OFF:**

Type . . . . . Independent dual speed PTO with front and rear power take-off. Rear stub shafts used for PTO speed conversion

Speed (1900 engine rpm) . Front—1000 rpm (see page 32)  
Rear—540 or 1000 rpm

**HYDRAULIC SYSTEM:**

Type . . . . . Closed center, constant pressure. Includes power steering, power brakes, implement control, and transmission-differential lubrication

Maximum pressure . . . . . 2250 psi

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

**GROUND SPEEDS:\*\***

1st . . . . .	1-3/4 mph
2nd . . . . .	2-3/4 mph
3rd . . . . .	3-1/2 mph
4th . . . . .	4-1/2 mph
5th . . . . .	5-1/2 mph
6th . . . . .	7-1/2 mph
7th . . . . .	9-1/4 mph
8th . . . . .	15-1/4 mph
3rd reverse . . . . .	3-1/2 mph
5th reverse . . . . .	5-1/2 mph
7th reverse . . . . .	9- mph

**FRONT WHEEL TREAD:** See pages 12 and 13

**REAR WHEEL TREAD:** See pages 14 and 16

	Row-Crop	Standard
<b>FRONT TIRES:**</b>	6.00-14, 6-ply	7.50-16, 6-ply
	6.00-16, 6-ply	

<b>REAR TIRES:**</b>	13.9-36, 6-ply	18.4-30, 6-ply
	13.6-38, 6-ply	

**DIMENSIONS:**

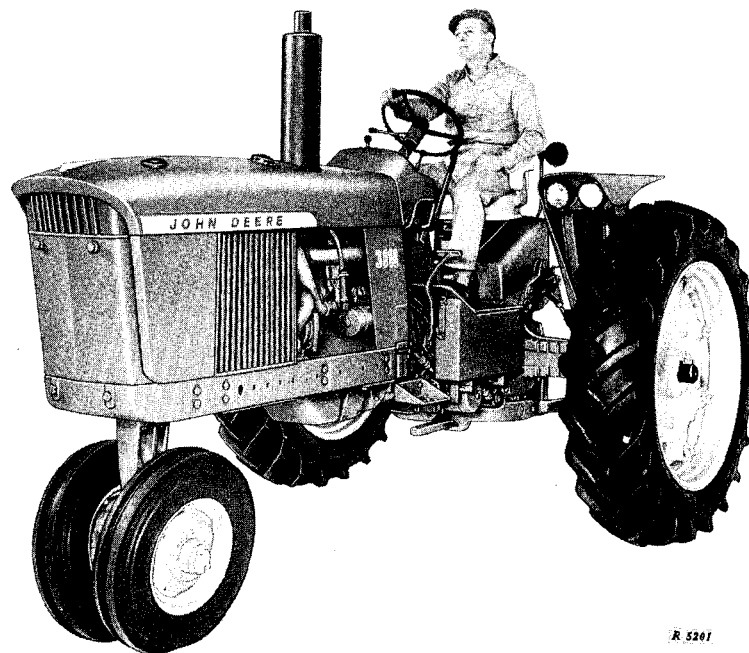
Wheelbase	90 in.	81-1/2 or 92-3/4 in.
Over-all length	138-1/2 in.	138-1/2 in.
Over-all height	86-5/8 in.	85-1/2 in.
Height to steering wheel	74-1/2 in.	77-1/2 in.
Width (regular axle)	86-5/8 in.	86-5/8 in.
Turning radius	103-1/2 in.	110 in.

**SHIPPING WEIGHT** (With equipment for average field service, less fuel and ballast):

	Row Crop	Standard
Diesel	6003 lbs.	6436 lbs.
Gasoline	5807 lbs.	6240 lbs.
LP-Gas	5936 lbs.	6359 lbs.

\*\*Calculated at 1900 rpm engine speed only. For ground speeds at 1500 through 2500 rpm engine speeds, see page 11.

\*\*\*Additional tires available for special purposes.



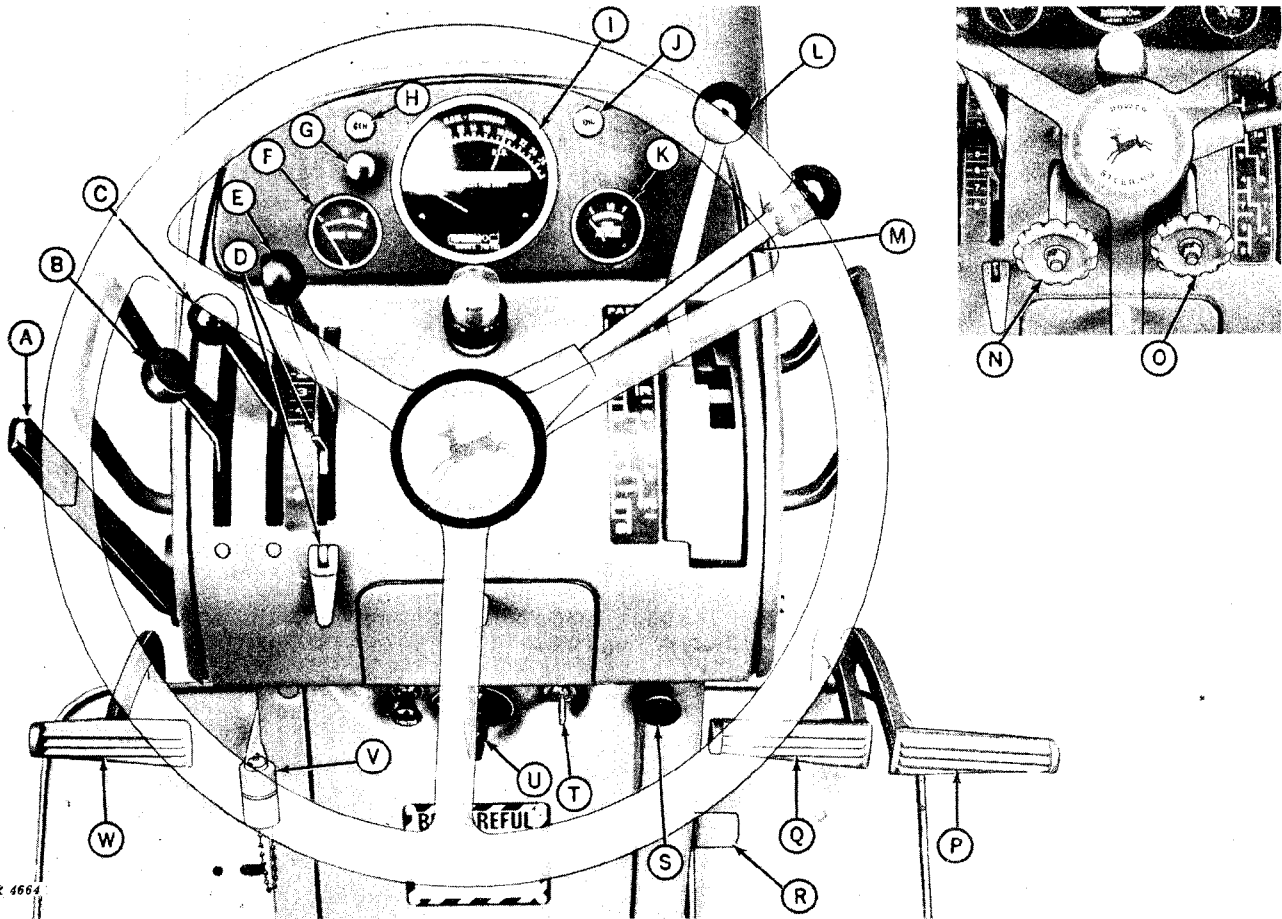
R 5201

John Deere 3010 Row-Crop LP-Gas Tractor



# controls and instruments

Before attempting to operate your new tractor, become familiar with the location and purpose of its controls and instruments. Study the next few pages carefully, regardless of your previous tractor experience.



- A - Power take-off clutch lever (page 32)
- B - Left-hand remote cylinder operating lever (page 27)
- C - Right-hand remote cylinder operating lever (page 27)
- D - Rockshaft control lever stop and lock (page 21)
- E - Rockshaft control lever (page 21)
- F - Water temperature gauge
- G - Speed indicator knob (page 11)
- H - Generator indicator light (page 6)
- I - Speed-hour meter (pages 11 and 42)
- J - Oil pressure indicator light (page 6)
- K - Fuel gauge
- L - Shift lever (page 11)
- M - Hand throttle (page 9)

- N - Liquid withdrawal valve (LP-Gas tractors) (page 7)
- O - Vapor withdrawal valve (LP-Gas tractors) (page 7)
- P - Right-hand brake pedal (page 10)
- Q - Left-hand brake pedal (page 10)
- R - Foot throttle (page 10)
- S - Engine stop knob (diesel tractors) (page 10)  
Engine choke knob (gasoline and LP-Gas tractors) (page 7)
- T - Key switch (page 6)
- U - Light switch (page 19)
- V - Cold weather ether starting fluid adapter (diesel tractors) (page 8)
- W - Clutch pedal (page 11)

## Seats

Your tractor may be equipped with either the regular seat or an optional deluxe seat. The regular seat is cushioned by no-sag springs and foam padding, while the deluxe seat uses 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.

Use only warm water and mild soap to clean the seat cushions. NEVER USE SOLVENTS.

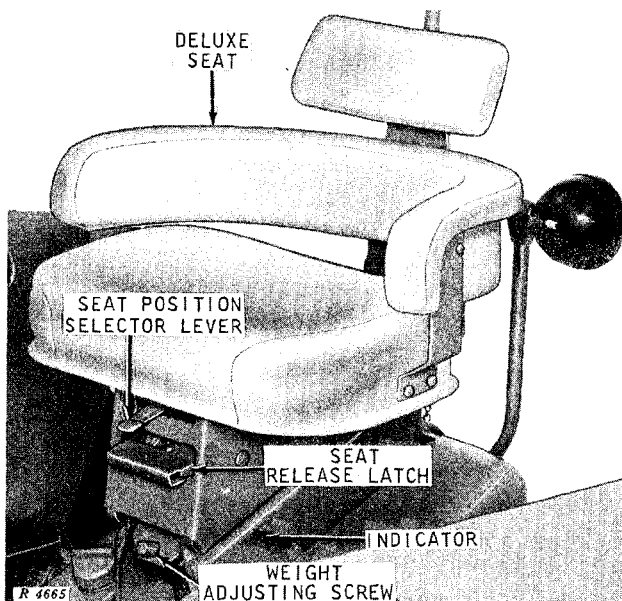
### Moving seat to upper, rear position

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

To move the regular seat out of the way for standing, lift the seat release latch and push the seat to the upper, rear position where it will latch. To return the seat to normal, preset operating position, lift the latch and allow the seat to move forward.

### Adjusting for height of operator

The normal operating position of the seat can be suited to the height of the individual operator. To make this adjustment, first move the seat to the upper, rear position. Then shift the seat posi-



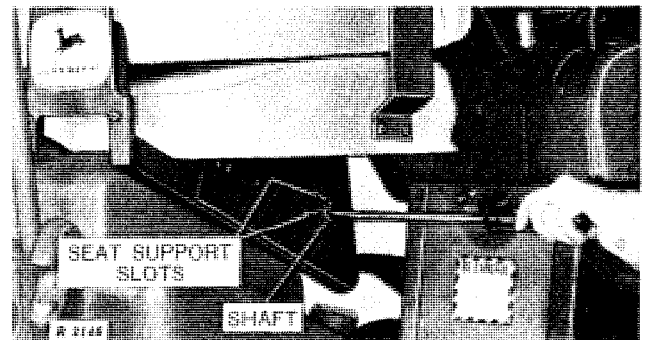
Seat Controls

tion selector lever between "short" and "tall" until the pedals and levers can be operated comfortably when you are seated. The seat will always return to this position when you sit down after having moved the seat up and to the rear for standing.

### Adjusting for weight of operator (deluxe seat)

You can adjust the tension of the steel compression spring of the deluxe seat to conform to your weight. This enables the seat to "float" when the tractor is driven over rough ground. To make this adjustment, turn the weight-adjusting screw clockwise or counter-clockwise until the indicator on the left-hand side of the seat conforms to your weight.

### Adjusting counterbalance spring (deluxe seat)



Turning Counterbalance Shaft

If the deluxe seat does not move fully to the rear when unlatched, adjust the counterbalance spring as follows. Push the seat to the upper, rear position. Insert a screwdriver in the slot in the counterbalance shaft and push in on the screwdriver to unlatch the shaft. Turn the shaft counter-clockwise until seat action is satisfactory. Line up the latch across the end of the shaft with one of the pairs of slots in the side of the seat support and release pressure on the screwdriver.

### Adjusting the back (regular seat)

The position of the back of the regular seat can be adjusted to suit the individual operator. To move the back up or down, remove the seat back attaching screws and move the back to the desired position.



# 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.

## Prestarting checks

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

(a) Check the engine crankcase oil level - see page 45.

(b) Check the radiator coolant level - see page 45.

(c) Change the air cleaner oil when the dirt level exceeds 3/8-inch - see page 45. If tractor has a precleaner, check the collector bowl - see page 45.

(d) If tractor has a fuel pump, check the sediment bowl - see page 46.

(e) Grease the Roll-O-Matic or wide front axle pivot pins and steering spindles - see page 46.

(f) Grease the front wheel bearings if the tractor has been operated in extremely wet or muddy conditions - see page 46.

## 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).*

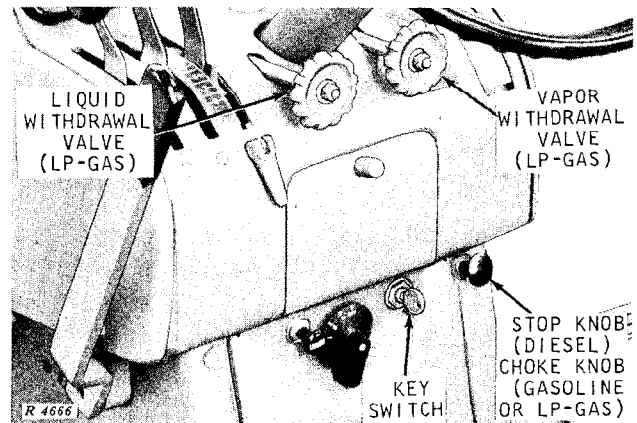
(2) Make sure the fuel shut-off valve on the bottom of the fuel tank is open - see page 52.

(3) See that the shift lever is in the "PARK" position. Depress the clutch pedal to decrease drag on the engine.

(4) PLACE THE HAND THROTTLE IN THE 1200 RPM POSITION, approximately one-third of its travel downward. Push the engine stop knob in.

(5) Turn the key switch clockwise to the first position. Both indicator lights should glow. If either 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. Do not hold the key switch in start position 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 such attempts, refer to "Trouble Shooting" (page 70).



Starting Controls

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

(7) After the engine starts, the generator and the oil pressure indicator lights should go out. If either light continues to glow when the engine is running faster than 800 rpm, stop the engine and determine the cause.

**CAUTION:** When the engine is running, leave the key switch in the on position so that the indicator lights will function.

## Starting the gasoline engine

(1) Perform the Prestarting checks on this page.

(2) Make sure the fuel shut-off valve on the bottom of the fuel tank is open - see page 52.

(3) See that the shift lever is in "PARK" position. Depress the clutch pedal to decrease drag on the engine.

(4) PLACE THE HAND THROTTLE IN THE 650 RPM POSITION, all the way up with the knob in.

(5) When the prevailing temperature is below 60 degrees Fahrenheit and the engine is cold, pull out on the engine choke knob.

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

(6) Turn the key switch clockwise to the first position. The generator and oil pressure indicator lights should glow. If either light fails to glow, turn the key switch off and determine the cause.

(7) Turn the key switch all the way to the right to start the engine. Do not hold the key switch in start position for more than 30 seconds at a time. To do so may overheat the starter. If the engine does not start the first time, pull the hand throttle down SLIGHTLY and wait a minute or two before trying again. If it does not start after four such attempts, refer to "Trouble Shooting" (page 70).

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

(8) As soon as the engine starts, push the choke knob in. During cold weather, it may be necessary to leave the choke partially on for the first few minutes.

(9) As the engine begins to run, check to see that the oil pressure and generator indicator lights go out. If either light continues to glow when the engine is running faster than 700 rpm, stop the engine and determine the cause.

### Starting the LP-Gas engine

(1) Perform the Prestarting checks on page 6.

(2) See that the shift lever is in "PARK" position. Depress the clutch pedal to decrease drag on the engine.

(3) PLACE THE HAND THROTTLE IN THE 650 RPM POSITION, all the way up with the knob in.

(4) 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.

(5) Turn the key switch clockwise to the first position. The generator and oil pressure indicator lights should glow. If either 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.

(7) In cold weather, if the engine does not start immediately, PLACE THE HAND THROTTLE IN THE 500 RPM POSITION (page 9). While the starter is cranking the engine, pull the choke knob out slowly until the engine fires regularly. Leave the choke in this position and slowly ad-

vance the hand throttle. Gradually push the choke knob in. DO NOT OVER-CHOKE.

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

Do not hold the key switch in the start position 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 to allow the starter to cool. If the engine does not start after four such attempts, refer to "Trouble Shooting" (page 70).

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

(8) As the engine begins to run, check to see that the oil pressure indicator light and generator indicator light go out. If either light continues to glow when the engine is running faster than 700 rpm, stop the engine and determine the cause.

(9) 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.



R 2206

**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

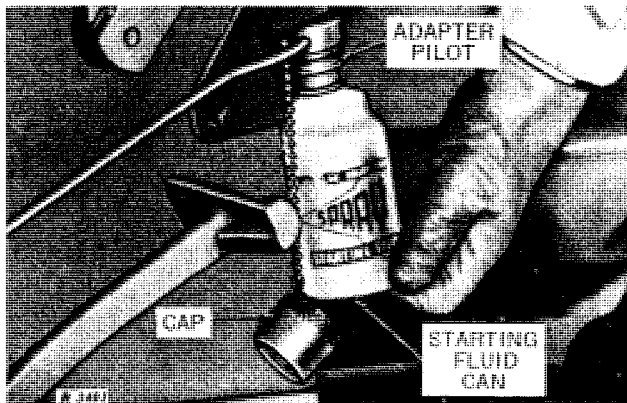
For cold weather starting, the diesel tractor is equipped with an ether starting fluid adapter. Other starting aids are available from your John Deere dealer for diesel, gasoline, or LP-Gas tractors.

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*

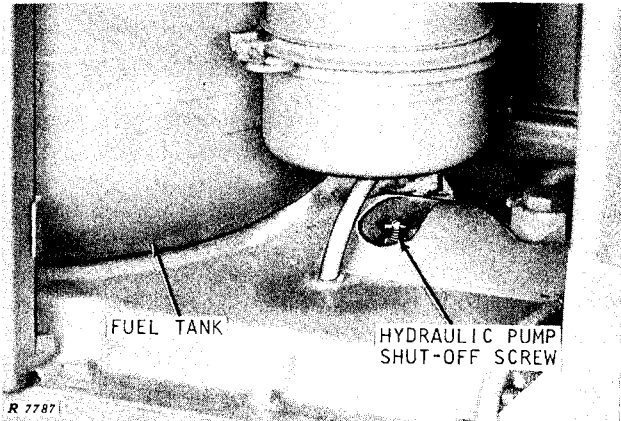
To inject starting fluid, push up on the can **WHILE OPERATING THE STARTER**. Relax pressure on the can between "shots" of starting fluid. Stop injecting the fluid after the engine starts. If the engine begins to die during the first few minutes of operation, inject another "shot" of starting fluid. 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.

### Shutting off hydraulic pump

During cold weather the starter speed may be increased by shutting off the hydraulic pump. To do so, turn the shut-off screw in (clockwise) one turn with a screwdriver. Then turn the screw in by hand until resistance is felt. With a screwdriver, turn the screw in one more turn. On some tractors, the shut-off screw may be on the bottom of the hydraulic pump.

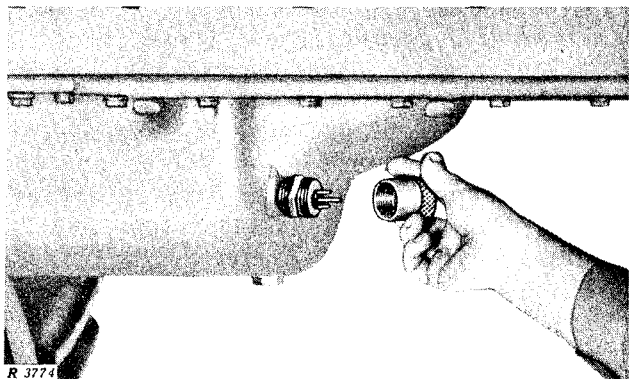


*Hydraulic Pump Shut-Off Screw*

After the engine has started, use a screwdriver to back the shut-off screw all the way out (turn the screw counter-clockwise). 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 heater



*Removing Cap from Crankcase Oil Heater*

To facilitate cold weather starting, a 240-watt, 115-volt electrical crankcase oil heater may be installed in the engine oil pan. To remove the electrical connector from the heater, press the release lever in the connector.

### Additional batteries

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

Use jumper cables to connect the positive (+) terminals of the booster batteries to the positive (+) terminals of the tractor batteries and the negative (-) terminals of the booster batteries to the negative (-) terminals of the tractor batteries. See your John Deere dealer for tractor-mounted booster batteries.

### Battery warmer

This warmer is used to warm the battery, permitting it to furnish electrical current to the starter efficiently in cold weather.

Place the battery warmer under the battery in the battery compartment and plug the cord from the warmer into any convenient 115-volt electrical source. If it was necessary to disconnect the battery, be sure to connect the battery cables properly (page 62).

### 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 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 2200 rpm. The engine can be operated at any speed in the working range to meet various operating con-

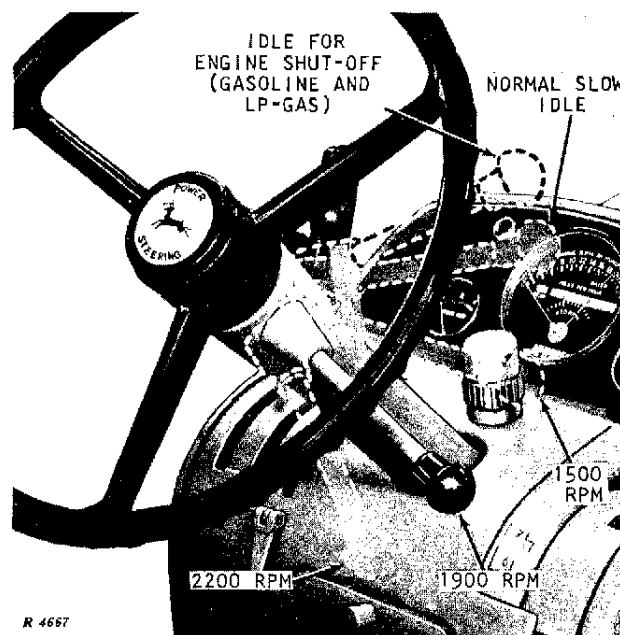
ditions. Operate the engine at 1900 rpm to obtain the SAE rated PTO speeds.

Normal slow idle is approximately 600 rpm. On a gasoline tractor, a 420 rpm idle speed is provided for engine shut-off. The engine shut-off idle speed is 500 rpm on an LP-Gas tractor.

In addition, engine speeds may be varied up to 2500 rpm to save you time when traveling on highways or on smooth-surfaced roads.

To check engine speeds, see page 49.

### 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 2200 rpm.

Push the throttle upward as far as it will go to obtain the normal slow idle speed (600 rpm for diesel tractors and 650 rpm for gasoline or LP-Gas tractors). To obtain the idle speed for engine shut-off on gasoline or LP-Gas tractors, pull out on the knob on the hand throttle and push the throttle upward as far as it will go. To obtain 1900 rpm load speed, pull the throttle downward to the first stop. Placing the throttle halfway between slow idle and 1900 rpm gives the 1500 rpm speed. Engine speeds between 1500 and 1900 rpm may be selected by moving the lever between these two positions.

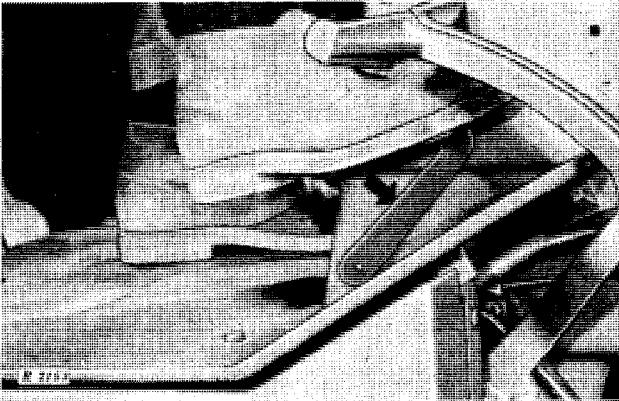
To obtain working speeds above 1900 rpm, pull out on the knob at the end of the hand throttle. With the knob pulled out, pull the throttle downward as far as it will go. This is the 2200 rpm position. Engine speeds between 1900 and 2200 rpm may be selected by moving the lever between these two positions.

## 10 Operation

### Using foot throttle

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

*NOTE: The foot throttle should not be used to increase the normal engine working speed.*



Operating the Foot Throttle

Place the shift lever 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

With the hand throttle in the 600 rpm position, pull out the stop knob to stop the engine.

### Gasoline engines

Pull out on the hand throttle knob and push the throttle up into the idle position for engine shut-off. Stop the engine by turning the key switch off.

### LP-Gas engines

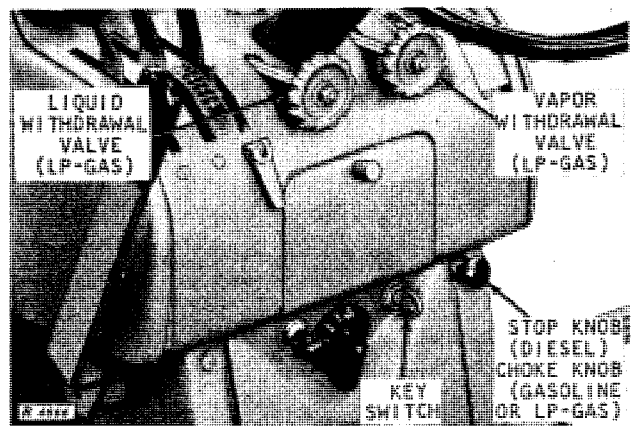
Close the withdrawal valves and let the engine run until all fuel is exhausted from the lines and the engine stops. Turn the key switch off.

**CAUTION: Never leave liquid fuel in the lines with the withdrawal valves closed. To do so can damage the fuel system. Never leave the tractor with the valves open.**

### All engines

After stopping the engine, remove the key from the switch to prevent tampering and unauthorized operation. Removing the key also prevents battery discharge in the event that the switch was accidentally left in the on or the accessory position (counter-clockwise from off).

A hook for a spare key is provided in the service card compartment.



Stopping Controls

### Breaking in the engine

To break in the engine properly, operate it with the hand throttle in the 1900 rpm position and at half load during the first 20 hours of service. With the throttle in this position, the engine speed at half load will be approximately 2050 rpm for diesel engines or 2100 rpm for gasoline engines. Do not use the foot throttle during the break-in period.

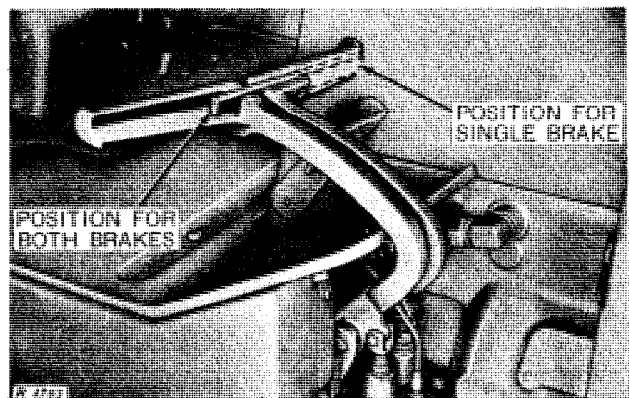
After 20 hours, drain the special breaking-in oil from the crankcase and replace the engine oil filter. Fill the crankcase with the proper oil (page 40). Your tractor is then ready for normal operation.

*NOTE: If the water temperature rises above the "N" range, shift to a lower gear to reduce the load.*

### Power steering and brakes

The tractor is equipped with full hydraulic power steering and power brakes so that a minimum of effort will operate the tractor.

To assist in making sharp turns, apply the brakes individually or, to stop the tractor, apply both brakes simultaneously. When traveling at high speeds, couple the pedals together as shown and use a light pressure on the pedals.



Brake Pedals Coupled Together

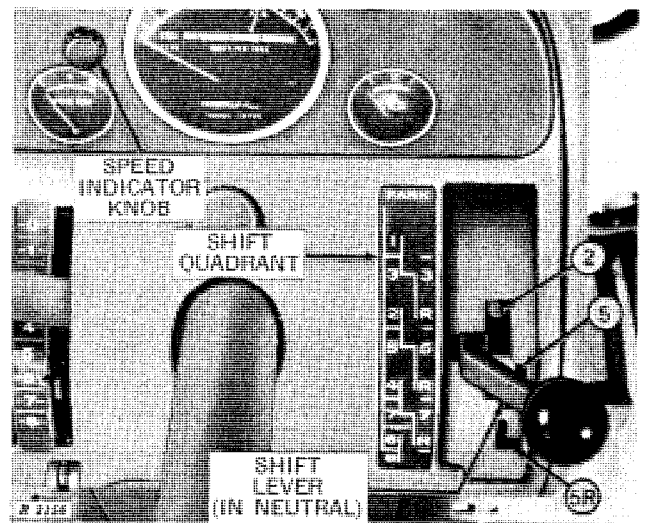
### Selecting ground speed

The tractor has 8 forward speeds and 3 reverse speeds for each of the throttle positions that may be used. These combinations enable the operator to balance speed and power for maximum economy and allow him flexibility to meet varying working conditions. For example, for 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 2200 rpm, and engine transport speeds may be varied up to 2500 rpm. Tractor ground speeds shown in the chart are only for engine speeds of 1500, 1900, 2200, and 2500 rpm.

Gates in the shift quadrant permit selection of the proper gear for the work to be done, as shown in the illustration. Turn the speed indicator knob on the instrument panel so that the speed-hour meter will show the correct tractor ground speed in miles per hour for the gear selected.

Avoid overloading the tractor. If the indicator hand drops below the engine speed established by the position of the hand throttle, the tractor is overloaded. When this occurs, shift to a lower gear. Overloading causes undue strain on parts, eventually resulting in poor operation and unnecessary repair expense.



Shift Lever, Shift Quadrant, and Speed Indicator Knob

### Shifting between stations

The shift quadrant has four shift stations. Stations No. 1, 2, and 3 have two forward speeds and one reverse speed. Station No. 4 has two forward speeds only. See page 12.

With the tractor stopped and the clutch pedal depressed, move the shift lever to a neutral position at the left side of the quadrant. Then move the shift lever to the station that has the desired speed. Move the lever to the right and into the speed desired.

Gradually release the clutch pedal to take up the load smoothly.

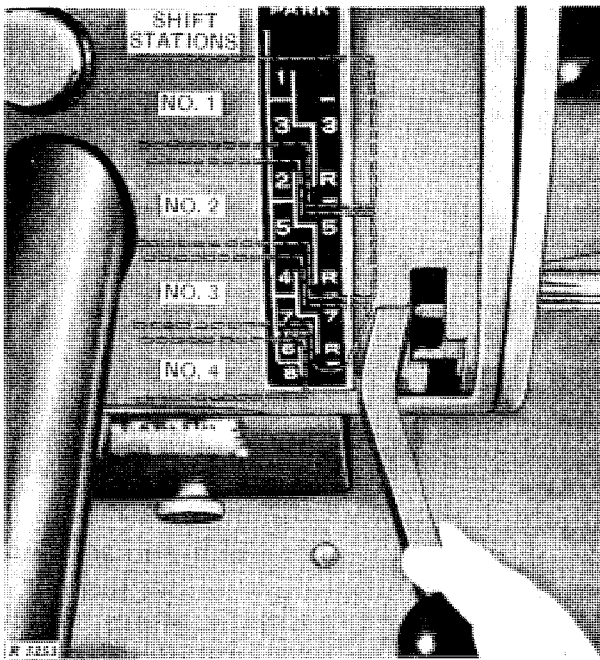
### TRACTOR GROUND SPEEDS

*NOTE: The ground speeds shown in this chart are for a tractor equipped with 13.6-38 rear tires with a loaded radius of 28.5 inches.*

Gear	Hand throttle operating range			Maximum foot throttle transport speed
	1500 rpm	* 1900 rpm	2200 rpm	2500 rpm
1st	1-1/4 mph	1-3/4 mph	2 mph	2-1/4 mph
2nd	2-1/4 mph	2-3/4 mph	3-1/4 mph	3-1/2 mph
3rd	2-3/4 mph	3-1/2 mph	4 mph	4-3/4 mph
4th	3-1/2 mph	4-1/2 mph	5-1/4 mph	6 mph
5th	4-1/2 mph	5-1/2 mph	6-1/4 mph	7-1/4 mph
6th	6 mph	7-1/2 mph	8-3/4 mph	9-3/4 mph
7th	7-1/2 mph	9-1/4 mph	10-3/4 mph	12-1/4 mph
8th	12-1/4 mph	15-1/4 mph	17-3/4 mph	20-1/4 mph
3rd reverse	2-3/4 mph	3-1/2 mph	.....	.....
5th reverse	4-1/4 mph	5-1/2 mph	.....	.....
7th reverse	7-1/4 mph	9 mph	.....	.....

\* 1900 rpm engine speed gives 540 or 1000 rpm PTO speed which is proper PTO speed for most implements. Some PTO-driven implements are operated at other engine speeds. For detailed instructions, see the implement operator's manual.

## 12 Operation



Shift Quadrant with Shift Lever in "TOW" Position

### Shifting within stations

With the clutch pedal depressed, the transmission can be shifted from one forward speed to the other forward speed within the same station while the tractor is in motion. For instance, you can shift between 1st and 3rd gears, 2nd and 5th gears, 4th and 7th gears, and 6th and 8th gears without stopping the tractor.

You can also shift from a forward speed to the reverse speed within the same station without stopping the tractor. However, to avoid injury and damage to the tractor, do so only at slow ground speed.

Gradually release the clutch pedal to engage the clutch.

### Parking the tractor

#### Shifting into "PARK"

When the tractor is stopped for parking, for holding it on an incline, or for holding it during PTO or belt work, move the shift lever as far as it will go forward from neutral to the "PARK" position.

**Be sure the tractor is stopped before placing the shift lever in "PARK" position.**

#### Shifting from "PARK"

Unless the tractor is parked on a steep incline, simply move the shift lever rearward to

the station desired. When the tractor is parked on a steep incline, it may be necessary to do the following to relieve load on the transmission park lock. Depress the clutch pedal and pull the shift lever back against spring pressure into the No. 1 shift station. Then shift into a forward or reverse gear that will move the tractor UP THE INCLINE. VERY SLOWLY engage the clutch and the transmission will shift out of "PARK."

### Towing the tractor

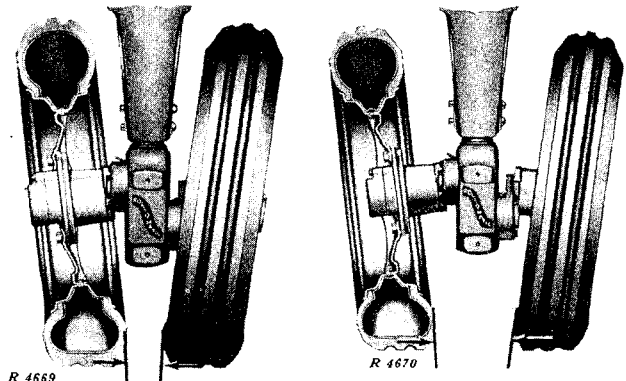
The shift quadrant on your tractor also has a "TOW" position. Whenever the tractor is to be towed, move the shift lever to this position.

**CAUTION: Never tow the tractor at high speed. Always attach a tow bar or chain to the tractor frame.**

### Front wheel tread

#### Double front wheels

The double front wheel tread may be set at the narrow spacing or at the wide spacing by reversing the dish of the front wheels.



Double Front Wheels at Narrow Spacing

Double Front Wheels at Wide Spacing

For ease in steering and clearance for front-mounted implements, dish the wheels inward as shown in the illustration. For listed crops where the front wheels are operated on a ridge or for muddy operating conditions where mud has a tendency to "ball up" between the wheels, set the wheels to the wide spacing.

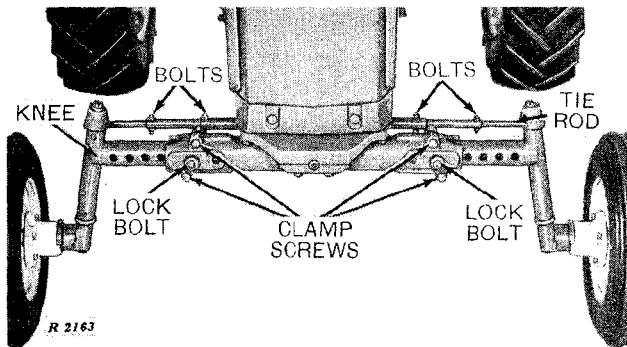
To change the double front wheel spacing, unbolt the wheels from the hubs, reverse the wheels and install them.

**Wide front axles**

*Adjustable-tread front axle*

The adjustable-tread front axle is adjustable in 2-inch steps. The following table lists the tread ranges available. For instructions on reversing the wheel "dish," see page 12.

Tractor and tire	Wheels dished in	Wheels dished out
Row-crop		
6.00-14	48-1/2" to 72-1/2"	58-1/4" to 82-1/4"
6.00-16	48-1/2" to 72-1/2"	58-1/4" to 82-1/4"
7.50-15	50-3/4" to 74-3/4"	55-7/8" to 79-7/8"
Standard	50" to 74"	55-1/4" to 79-1/4"



Front Wheel Tread Adjustment (Row-Crop Tractor Illustrated)

To adjust the tread width, jack up the front end of the tractor.

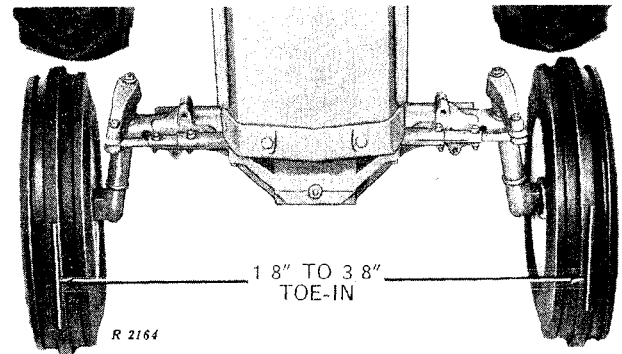
**CAUTION:** Do not place jack under engine oil pan.

Loosen the clamp screws and remove the lock bolts from the front axle housing. Remove the bolts from the tie rods and move the front axle knees in or out to give the desired tread width. Install the bolts in the tie rods and axle housing. Tighten the clamp screws securely (to 300 foot-pounds torque). Coat unpainted surfaces with rust preventive or heavy grease. Check toe-in.

*Fixed-tread front axle (Standard tractor)*

The front wheel tread width on a standard tractor with fixed-tread front axle is 55-1/2 inches with the wheels "dished" inward. When the wheels are dished outward, the tread width is 60-3/4 inches. For instructions on reversing the wheel "dish," see page 12.

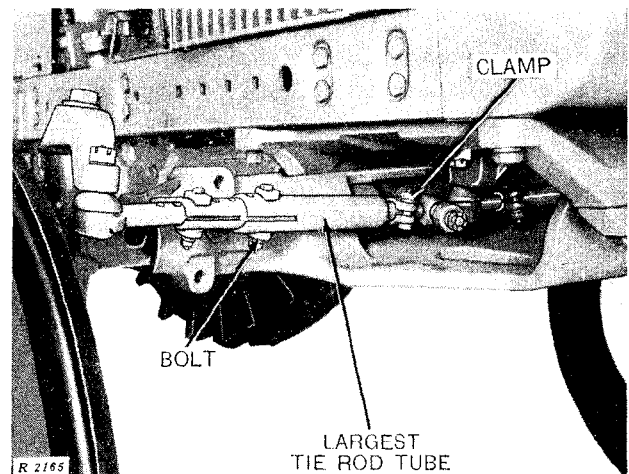
*Toe-in adjustment*



Correct Toe-in (Standard Tractor Illustrated)

Toe-in of the front wheels on a tractor with wide front axle should be 1/8 to 3/8 inch.

To check toe-in, turn the steering wheel until the front wheels point straight ahead, parallel to the center line of the tractor. Measure the distance from tire to tire, first at the front of the tires and then at the rear. Front measurement should be 1/8 to 3/8 inch less than rear measurement.



Toe-in Adjustment (Standard Tractor Illustrated)

To adjust toe-in on adjustable tread axles, remove the bolts from the largest tie rod tubes and loosen the clamps on the inner end of the tie rods. On fixed tread axles, loosen the tie rod clamps.

Turn the tie rod tubes in or out until toe-in is correct. Replace the bolts and tighten the clamps. Do not overtighten the clamps. Both wheels must have equal toe-in.

### Rear wheel tread

#### Regular and offset wheels

##### Range of adjustment

The tread ranges listed in the following charts are obtained by moving the wheel on the axle by the rack and pinion, by reversing the wheel on the axle, or by changing the rim position on the wheel.

#### ROW-CROP TRACTORS

Wheel type	Axle type	Possible tread widths
Regular	Regular	60" to 91"
	Long	62" to 98"
	Extra Long	67" to 113"
Offset	Regular	60" to 97"
	Long	60" to 103"
	Extra Long	61" to 119"

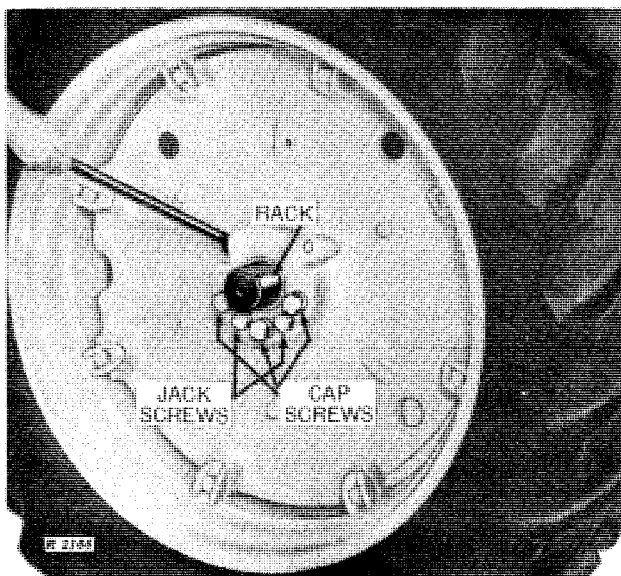
#### STANDARD TRACTORS

Axle type	Possible tread widths
Regular	63" to 91"
Long	63" to 97"

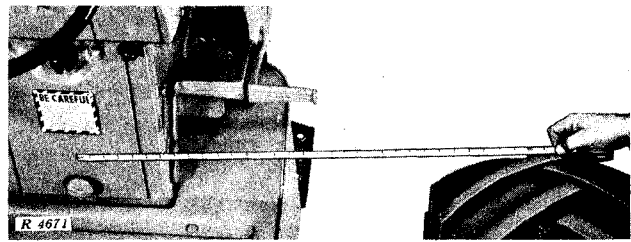
##### Rack and pinion method

This method of rear wheel tread adjustment is accomplished by turning a pinion gear in the wheel hub. The pinion engages a rack on the axle to move the wheel in or out on the axle.

The rack and pinion adjustment may be made with up to two wheel weights installed. Addition-



Rack and Pinion Adjustment



Measuring Distance from Center of Tractor to Center of Tire

al weights will interfere with turning of the pinion.

Rotate the wheel until the rack on the axle is up. Loosen the three cap screws 1/4 to 3/8-inch. Turn each of the two jack screws clockwise until the outer groove in each jack screw is flush with the outer surface of the wheel hub.

Jack up the tractor and turn the pinion gear to slide the wheel in or out on the axle. Measure the distance from the center of the tractor to be sure the rear wheels are correctly spaced.

After the desired tread is obtained, back out the jack screws until the inner groove of each jack screw is flush with the face of the hub. Lubricate cap screw threads and tighten cap screws securely.

**CAUTION:** Adjusting the wheel too close to the rear axle housing can damage the pinion when the hub is tightened. Be sure that the tire or weights do not rub the tractor. The jack screws must be free to turn after the hub is tightened.

Adjust the other wheel in the same manner. Normally, both wheels are set the same distance from the tractor center line. After a few hours of operation, RETIGHTEN cap screws and keep them tight.

##### Reversing wheel on the axle

On tractors with offset wheels or wheels for deep well rims, the rear wheel tread can be changed by reversing the "dish" of the wheel.

To change the wheel "dish," jack up the tractor and move the wheel outward. See "Rack and pinion method." Remove the wheel and tire, reverse the "dish," and install the wheel on the axle. To maintain proper direction of tire rotation, it will be necessary to install the wheel and tire on the other axle.

##### Changing rim position on wheel

The rim is held to the wheel by clamps that engage a raised ring or deep well around the inside of the rim. Tread adjustment can be ac-

complished by changing the rim position on the wheel.

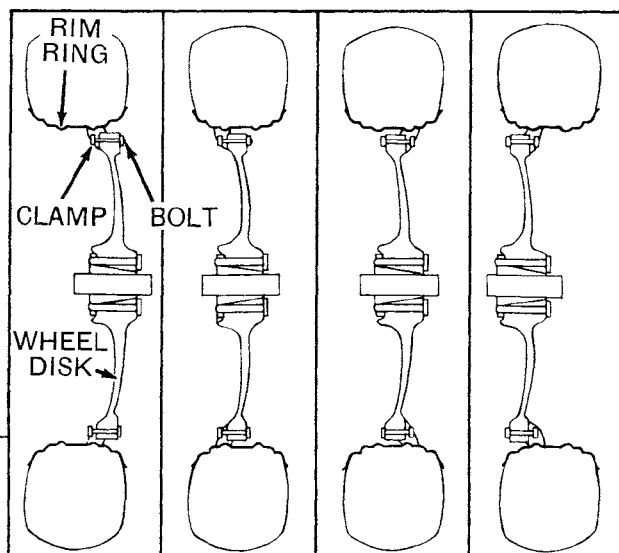
If the rims have a double rim ring, the clamps can be installed on either side of the wheel and can engage either one of the two raised rings on the rim. This gives four possible rim positions on the wheel as shown.

To change the position of the rim on the wheel, jack up the tractor until there is little or no weight on the tire. Remove the rim clamps and shift the rim or wheel to the desired position. Install the clamps and tighten evenly.

Hammer each bolt head to seat the bolts. Retighten the clamps securely. Adjust both rear wheels in the same manner.

After a few hours service, RETIGHTEN the clamps.

**REAR WHEEL TREAD WIDTHS**



WHEEL TYPE	AXLE TYPE	DISK POSITION				
REGULAR WHEEL	*REGULAR AXLE	-----	60"-76"	64"-84"	63"-83"	71"-91"
	LONG AXLE	-----	62"-83"	70"-91"	69"-90"	77"-98"
	EXTRA LONG AXLE	-----	67"-98"	75"-106"	74"-105"	82"-113"
OFFSET WHEEL	REGULAR AXLE	DISH IN	60"-69"	60"-77"	60"-76"	65"-84"
		DISH OUT	67"-82"	75"-90"	74"-89"	82"-97"
	LONG AXLE	DISH IN	60"-76"	64"-84"	63"-83"	71"-91"
		DISH OUT	72"-88"	80"-96"	79"-95"	87"-103"
	EXTRA LONG AXLE	DISH IN	61"-92"	69"-100"	68"-99"	76"-107"
		DISH OUT	77"-104"	85"-112"	84"-111"	92"-119"

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*\*Minimum tread width on standard tractors is 63 inches. Maximum tread width on standard tractors equipped with regular axles is 3 inches greater than shown on the chart.*



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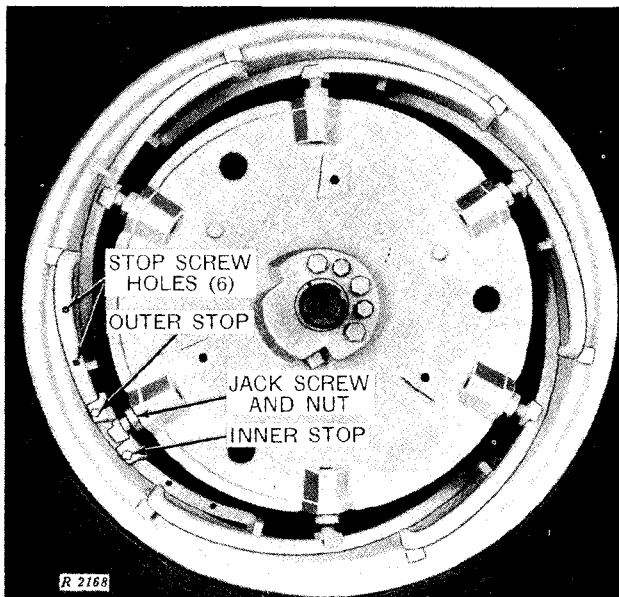
## 16 Operation

### Power-adjusted wheels (Row-Crop Tractors only)

Power-adjusted wheels use engine power to change rear wheel tread without jacking up the tractor. 24 inches of tread adjustment in 4-inch increments is obtained by power adjustment. In addition, the wheels can be moved on the axle by the rack and pinion (page 14). Possible tread widths are as follows:

Power-Adjusted Wheel Tread Widths

Axle type	Possible tread widths
Regular	60" to 97"
Long	60" to 104"
Extra long	65" to 120"



Power-Adjusted Rear Wheel

**NOTE:** When decreasing the tread, make sure that tire will not contact fender.

To change tread, one wheel at a time, remove set screw and move stop to desired hole in rail. When adjusting to the extreme position, only one stop is used.

Loosen three uppermost adjacent jack screws, shift to lowest speed gear of proper direction, and apply brake for other wheel. Slowly engage clutch to rotate wheel disk until jack screw contacts stop. Move stop to hole in rail against jack screw.

Tighten the three loosened jack screw nuts to 250 foot-pounds torque (160-pound pull at hole in special wrench). Do not lubricate jack screw nuts.

Adjust other wheel in same manner.

After a few hours service, **RETIGHTEN** jack screw nuts. It is very important to keep rim centered around wheel disk.

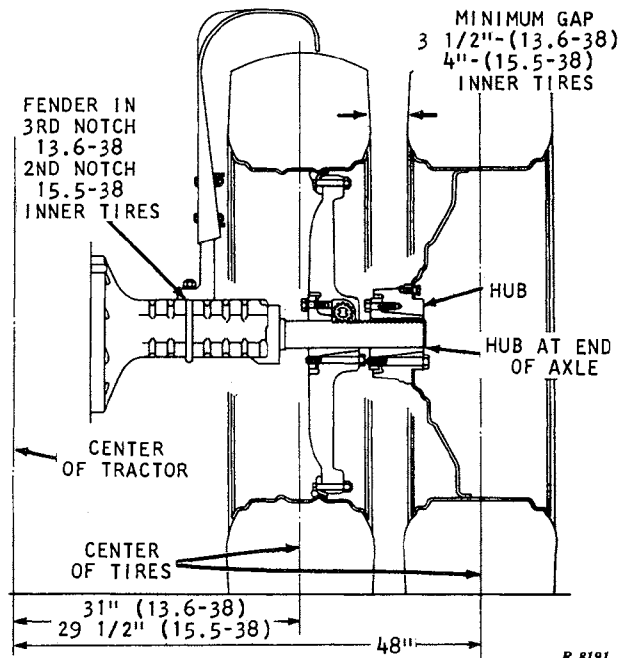
### Dual wheels (Row-Crop Tractors only)

Row-Crop tractors can be equipped with dual wheels. The inner wheel (regular or heavy-duty) can have either 13.6-38 or 15.5-38 tires. The outer steel rim and disk wheels have 13.6-38 tires and are attached to a cast hub on the axle.

Position each fender and dual wheel as shown in the illustration with outer dual hub at end of axle; never beyond. With proper rear wheel treads the gap between the tires will be 3-1/2 inches with 13.6-38 inner tire or 4 inches with a 15.5-38 inner tire. Insufficient gap can damage the tires.

It is very important that inner wheel rim nuts and hub cap screws be securely tightened because outer wheel must be removed to retighten them. Tighten outer steel wheel disk cap screws to 80 foot-pounds torque.

**CAUTION:** NEVER operate tractor with a loose wheel, rim, or hub.



Dual Wheels

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