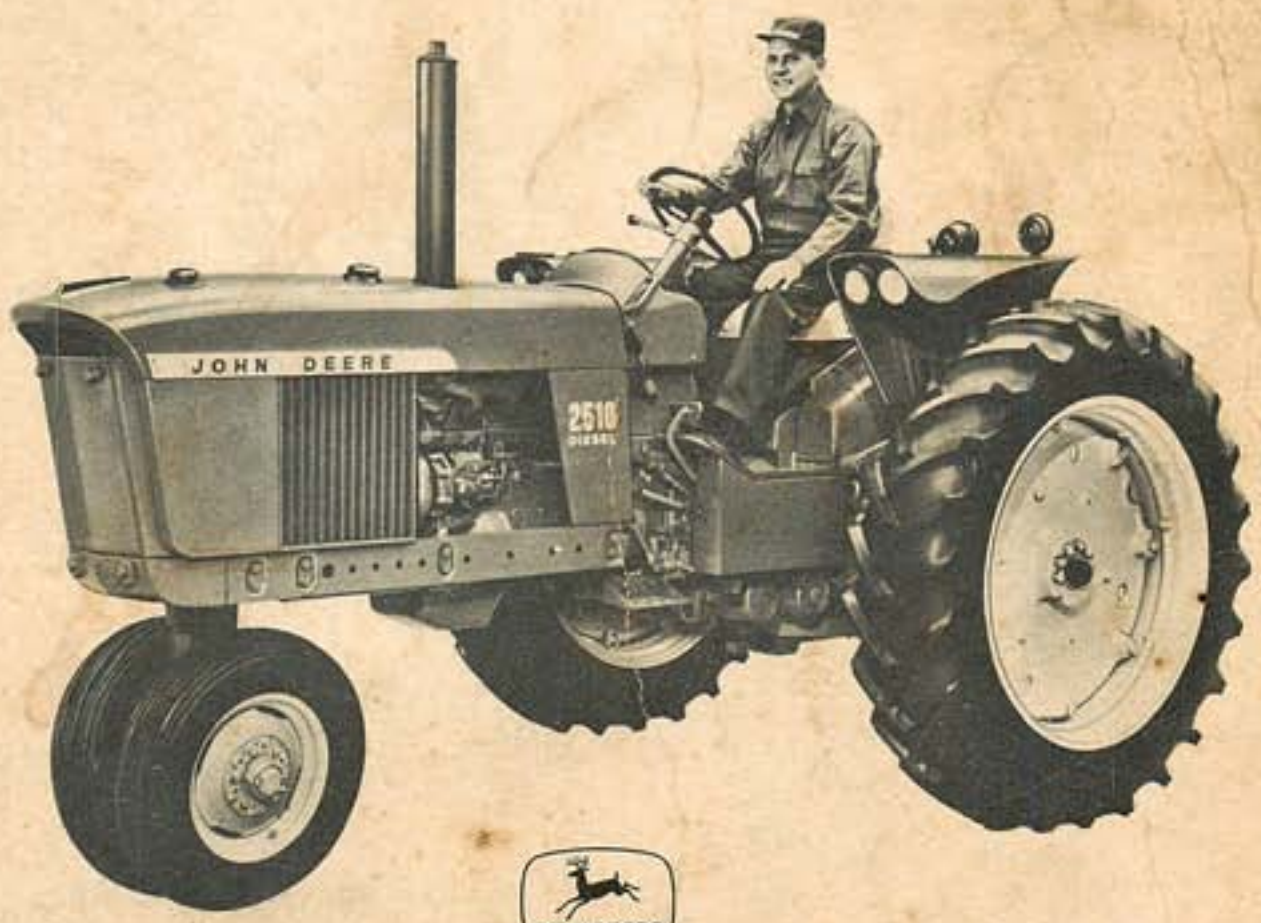
OPERATOR'S MANUAL

OM-R38357

# JOHN DEERE

# 2510 ROW-CROP AND HI-CROP TRACTORS




JOHN DEERE

# CONTENTS




R 6217

*John Deere 2510 Hi-Crop Tractor with Diesel Engine and Power Shift Transmission*

# SPECIFICATIONS

| HORSEPOWER: * | Diesel | Gasoline |
|---|---|---|
| Observed at PTO (Syncro-Range) | 53 h.p. | 53 h.p. |
| Observed at PTO (Power Shift) | 49 h.p. | 49 h.p. |
| **ENGINE:** | | |
| Type | 4-cylinder, in-line, valve-in-head | |
| Engine speeds: | | |
| Idle for engine shut-off | ..... | 425 rpm |
| Normal slow idle | 800 rpm | 800 rpm |
| Working range | 1500 to 2500 rpm | 1500 to 2500 rpm |
| Bore and stroke | 3.86 in. x 4.33 in. | 3.86 in. x 3.86 in. |
| Displacement | 202 cu. in. | 180 cu. in. |
| Compression ratio | 17 to 1 | 7.5 to 1 |
| Firing order | 1-3-4-2 | 1-3-4-2 |
| Intake valve clearance | 0.014 in. | 0.014 in. |
| Exhaust valve clearance | 0.018 in. | 0.022 in. |
| Injection pump timing | TDC | ..... |
| Distributor timing (2500 rpm engine speed) | ..... | "S" mark |
| Distributor point gap | ..... | 0.020 in. |
| Spark plug gap | ..... | 0.025 in. |
| **ELECTRICAL SYSTEM:** | | |
| Starter and alternator voltage | 12 volts | 12 volts |
| Lights and accessory voltage | 12 volts | 12 volts |
| 12-volt battery, 78-plate, 75 amp-hour | Two | One |

**Factory observed horsepower at 2500 engine rpm.*


R 6218

*John Deere 2510 Row-Crop Tractor with Gasoline Engine, Syncro-Range Transmission, and Wide-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 | -- | 26 U.S. gals. |
| Crankcase (includes filter) . . . . . | -- | 7 U.S. qts. |
| Transmission-hydraulic system: | | |
| 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. |
| Oil bath air cleaner . . . . . Diesel | -- | 2-3/4 U.S. pints |
| Gasoline | -- | 2-1/4 U.S. pints |
| Cooling system. . . . . | -- | 14 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 TAKE-OFF:
- Type . . . . . Independent PTO with front and rear power take-off. Stub shafts used for rear PTO speed conversion on dual speed PTO.
- Speed (2100 engine rpm) . . . . . Front—1000 rpm; Dual speed rear—540 or 1000 rpm; Single speed rear—1000 rpm

*Specifications and design subject to change without notice.*

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 12

FRONT TIRES**
- Row-crop . . . . . 6.00 - 16, 6-ply
- Hi-crop . . . . . 7.50 - 20, 6-ply

REAR TIRES**
- Row-crop . . . . . 13.6 - 38, 6-ply
- Hi-crop . . . . . 13.6 - 38, 6-ply

FRONT WHEEL TREAD . . . . . See page 16

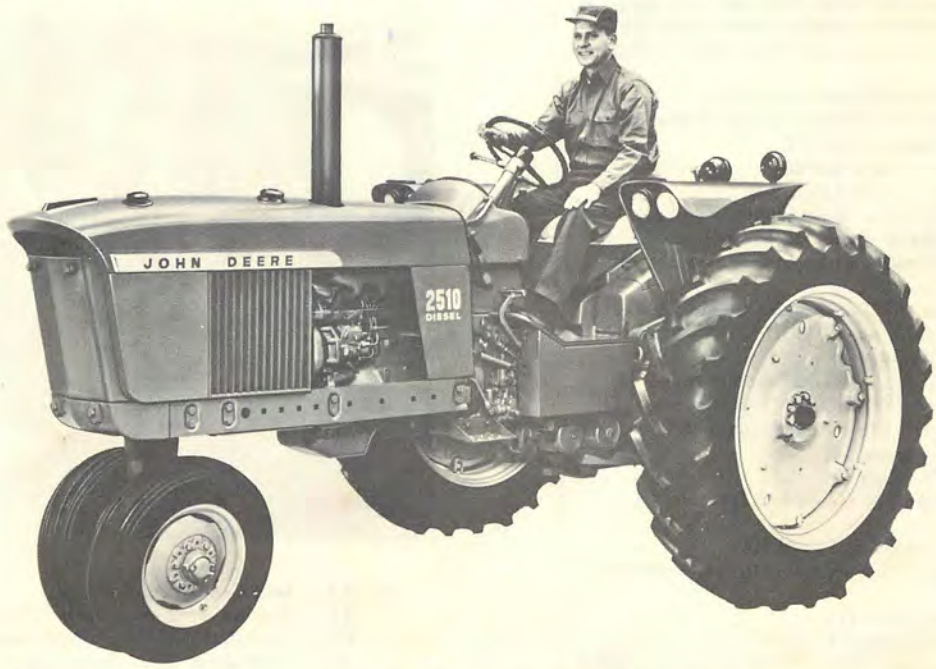
REAR WHEEL TREAD:
- Regular and offset wheels . . . . . See page 18
- Dual wheels . . . . . See page 19

| DIMENSIONS | Row-Crop | Hi-Crop |
|---|---|---|
| Wheel base | 90 in. | 92.8 in. |
| Over-all length | 140 in. | 140 in. |
| Height to steering wheel | 74.4 in. | 89.9 in. |
| Width (regular axle) | 86.2 in. | 95.4 in. |
| Turning radius | 108 in. | 148 in. |

SHIPPING WEIGHT (With equipment for average field service, less fuel and ballast.) Subtract 255 lbs. if tractor has Syncro-Range transmission:

| | Row-Crop | Hi-Crop |
|---|---|---|
| Diesel | 6350 lbs. | 7380 lbs. |
| Gasoline | 6200 lbs. | 7230 lbs. |

***Additional tires available for special purposes.*

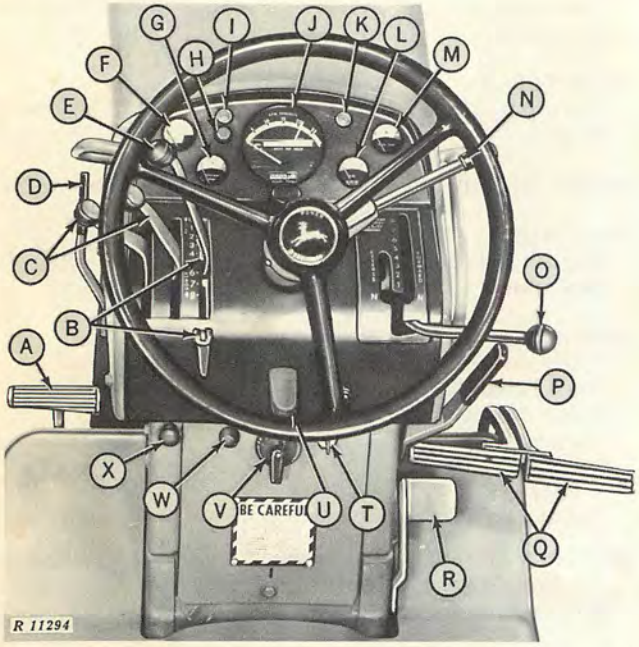



R 6216

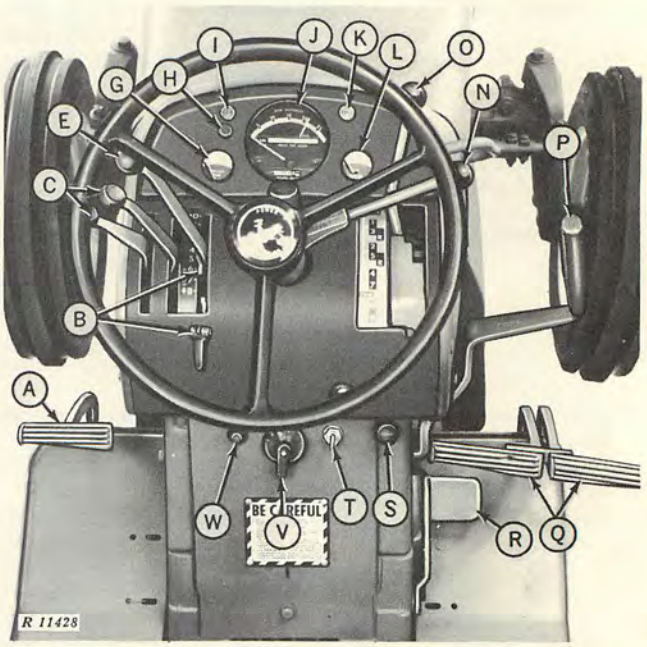
*John Deere 2510 Row-Crop Tractor with Diesel Engine, Power Shift Transmission, and Roll-O-Matic*

# 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.

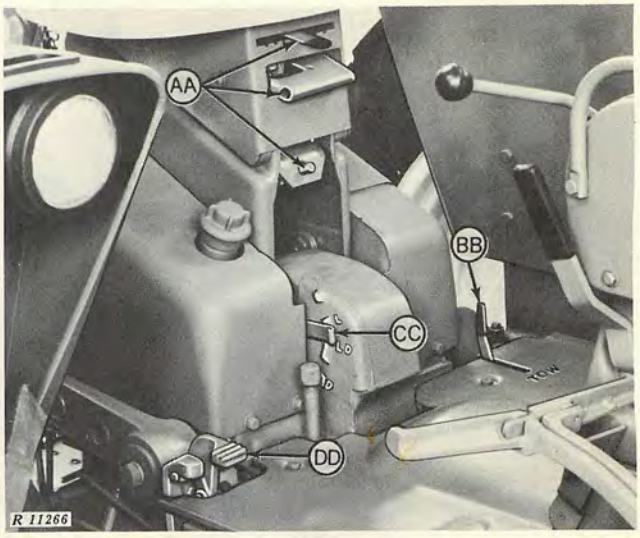



*Tractor with Diesel Engine and Power Shift Transmission*




*Tractor with Gasoline Engine and Syncro-Range Transmission*

A – Clutch Pedal (Syncro-Range Tractors, page 14)
Inching Pedal (Power Shift Tractors, page 12)
B – Rockshaft Control Lever Stop and Lock (page 25)
C – Remote Cylinder Operating Levers (page 32)
D – Engine Disconnect Lever (Power Shift Tractors, page 8)
E – Rockshaft Control Lever (page 25)
F – Transmission Oil Pressure Gauge (Power Shift Tractors, pages 8 and 13)
G – Coolant Temperature Gauge
H – Speed Indicator Knob (page 12)
I – Alternator Indicator Light (pages 5 and 6)
J – Speed-Hour Meter (pages 12 and 45)
K – Oil Pressure Indicator Light (pages 5 and 6)
L – Fuel Gauge
M – Transmission Oil Temperature Gauge (Power Shift Tractors, page 13)
N – Hand Throttle (page 9)
O – Shift Lever (Syncro-Range Tractors, page 14)
Speed Selector (Power Shift Tractors, page 12)
P – Power Take-Off Clutch Lever (page 37)
Q – Brake Pedals (page 16)
R – Foot Throttle (page 9)
S – Engine Choke Knob (Gasoline Tractors, page 6)
T – Key Switch (pages 5, 6, and 10)
U – Ether Starting Fluid Adapter (Diesel Tractors, page 7)
V – Light Switch (page 23)
W – Starter Switch (pages 5 and 6)
X – Lever Latch Knob (Power Shift Tractors, page 8)




AA – Seat Controls (page 11)
BB – Tow Lever (Power Shift Tractors, page 15)
CC – Rockshaft Selector Lever (page 26)
DD – Differential Lock Pedal (page 15)

# 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 49.

(2) Check the radiator coolant level—see page 49.

(3) If tractor has an oil-bath air cleaner, check the oil and dirt level in the cup—see page 49. If tractor has a pre-cleaner, check the collector bowl—see page 49.

(4) Check the fuel pump sediment bowl—see page 50.

(5) Grease the wide-swing drawbar rollers, Hi-Crop rear axles, and the Roll-O-Matic or wide front axle grease fittings—see page 50.

(6) Grease the front wheel bearing if the tractor has been operated in extremely wet or muddy conditions—see page 50.

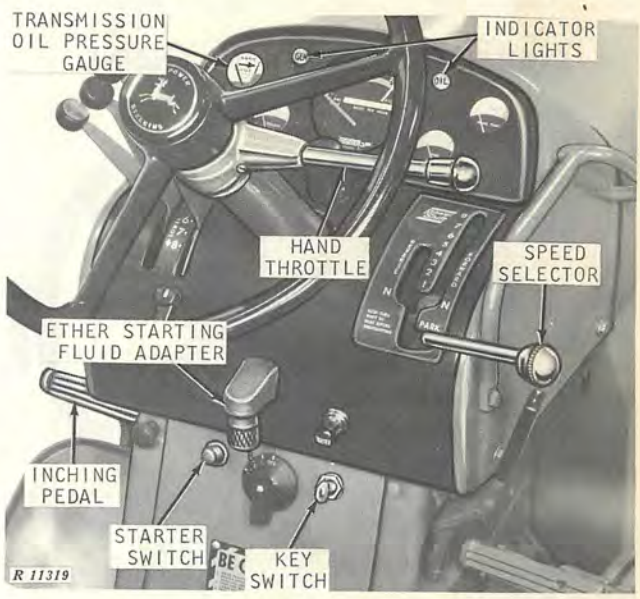
(7) Make sure the fuel shut-off valve on the bottom of the fuel tank is open—see page 58.

### 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 7).*

Perform the Prestarting checks listed above.

(1) If your tractor has a Syncro-Range transmission, move the shift lever into "PARK" position and depress the clutch pedal. If your tractor has a Power Shift transmission, move the selector lever into "PARK" position and depress the inching pedal.




*Diesel Starting Controls*

(2) PLACE THE HAND THROTTLE IN THE 1200 RPM POSITION, approximately one-third of its travel downward.

(3) Turn the key switch clockwise to the on position. Both indicator lights should glow. If either light fails to glow, turn off the key switch and determine the cause.

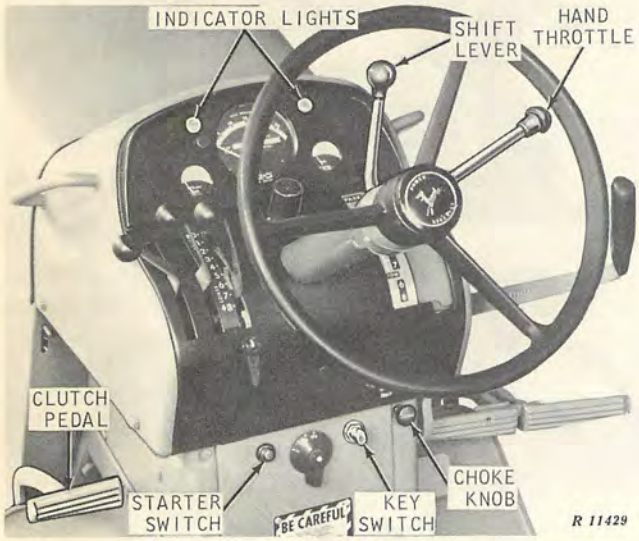
(4) Press on the starter switch to start the engine. Do not press on the starter switch for more than 30 seconds at a time. To do so may overheat the starter. If the engine does not start the first time, wait for a minute or two before trying again. If it does not start after four attempts, see "Trouble Shooting" (page 73).

If the starter 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.

(5) After the engine starts, both indicator lights should go out. If either light continues to glow after the engine has been running 10 seconds, stop the engine and determine the cause. When the engine is running, always leave the key switch in the "ON" position so that the indicator lights will function.

On tractors with Power Shift transmission, check to see that the transmission oil pressure gauge indicates oil pressure. Operating the engine when gauge shows insufficient pressure may damage the tractor. See pages 8 and 13.

## STARTING THE GASOLINE ENGINE




*Starting Controls on Gasoline Tractors with Syncro-Range Transmission*

Perform the Prestarting checks listed on page 5.

(1) If your tractor has a Syncro-Range transmission, move the shift lever into "PARK" position and depress the clutch pedal. If your tractor has a Power Shift transmission, move the selector lever into "PARK" position and depress the inching pedal.

(2) When the engine is cold, pull the hand throttle down, pull the choke knob out, and push the hand throttle all the way up with the knob out (idle for engine shut-off position).

If the engine is warm, place the hand throttle in the 800 rpm position, all the way up with the knob in.

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

(3) Turn the key switch clockwise to the "ON" position. The alternator and oil pressure indicator lights should glow. If either light fails to glow, turn the key switch off and determine the cause.

(4) Press on the starter switch to start the engine. To prevent overheating the starter, do not operate the starter for more than 30 seconds at a time and then wait a minute or two before trying again. If the engine does not start and the choke was not pulled out, momentarily pull the choke knob out while starting the engine. If it does not start after four such attempts, see "Trouble Shooting" (page 73).

If the starter 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.

(5) If the choke was used as recommended in Step 2, push the knob in after the engine starts. During cold weather, it may be necessary to leave the choke partially on for the first few minutes.


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

(6) As the engine begins to run, check to see that both indicator lights go out. If either light continues to glow after the engine has been running faster than 700 rpm for more than 10 seconds, stop the engine and determine the cause.

On tractors with Power Shift transmission, check to see that the transmission oil pressure gauge indicates oil pressure. Operating the engine when gauge shows insufficient pressure may damage the tractor. See pages 8 and 13.

## 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)


*Injecting Starting Fluid*

The diesel tractor is equipped with this adapter which is used to inject atomized ether 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.

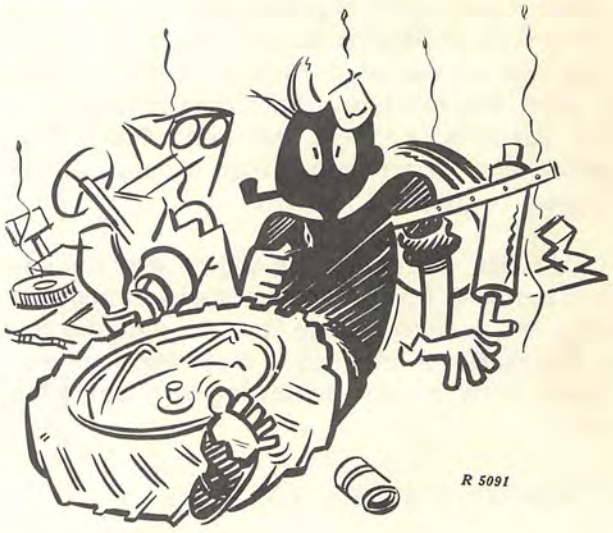
To inject starting fluid, push up on the can.

**CAUTION: To avoid damage, turn engine with starter one or two revolutions before injecting starting fluid and 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.

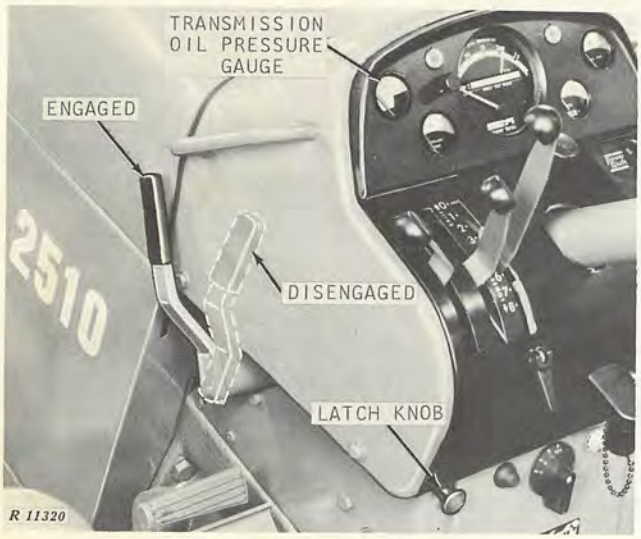
Be sure to install the cap on the adapter when it is not in use. This will prevent dust from being drawn into the engine.

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 while pulling out on the latch knob. Hold the knob out and allow the lever to move forward to the engaged position. Release the latch knob. The transmission oil pressure gauge should indicate oil pressure (pages 5 and 13).

**CAUTION: 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 the engine of a Power Shift tractor by towing or pushing the tractor.**

SHUTTING OFF HYDRAULIC PUMP

Starter speed may be increased during cold weather by shutting off the hydraulic pump so it will not build up pressure. The hydraulic pump shut-off screw assembly is available from your John Deere dealer and it is installed on top of the hydraulic pump which is to the rear of the fuel tank.

To shut the pump off, 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 out against the internal stop (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

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. To use the heater, remove the cap, connect the cord to the heater and to any convenient 115-volt electrical source. To remove the electrical connector from the heater, press the release lever in the connector.

ADDITIONAL BATTERIES

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

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

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. Connect one end of the other jumper cable to the negative post of the booster battery and connect the other end of the jumper cable 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 will damage the alternator or the electrical wiring.*

## 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 SAE rated PTO speeds.

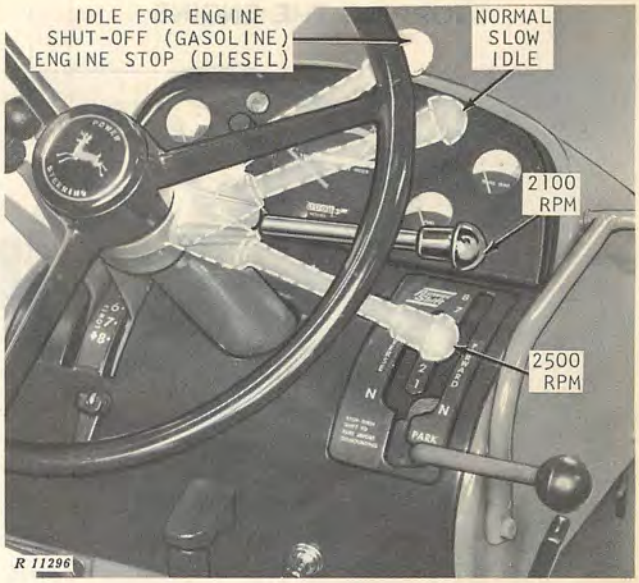
Normal slow idle is approximately 800 rpm. On a gasoline tractor, a 425 rpm idle speed is provided for engine shut-off.

To check engine speeds, see page 54.

### USING HAND THROTTLE

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

Push the throttle upward with the knob in to obtain the normal slow idle speed of 800 rpm. To obtain the idle speed for engine shut-off on gasoline tractors, pull out on the knob on the hand throttle and push the throttle upward as far as it will go. To obtain the 2100 rpm load speed,




*Range of Hand Throttle Positions*

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 rpm and 2100 rpm may be selected by moving the lever between these two positions.

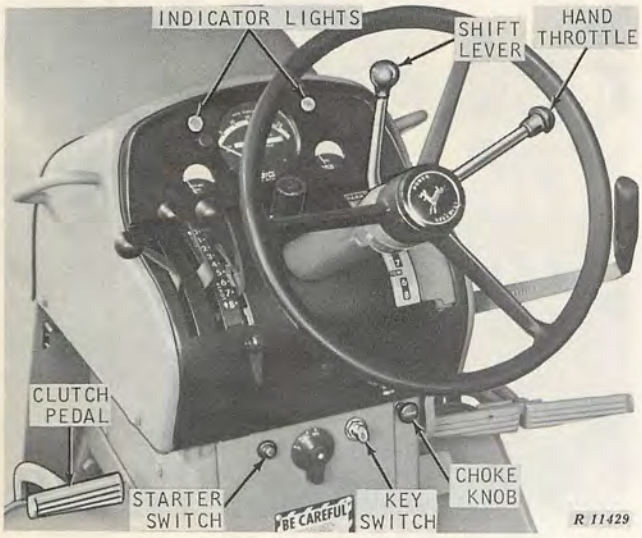
To obtain working speeds above 2100 rpm, pull out on the knob at the end of the hand throttle. With the knob pulled out, pull the throttle downward as far as it will go. This is the 2500 rpm load speed position. Engine speeds between 2100 and 2500 rpm may be selected by moving the lever between these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

### USING FOOT THROTTLE


*Foot Throttle*

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

## 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

Pull out on the hand throttle knob and push the throttle up into the engine stop position. Turn the key switch off.

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.

BOTH 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 accidently left in the "ON" position.

## BREAKING IN THE ENGINE

*NOTE: If the coolant temperature rises above the "N" 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 45.*

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

DIESEL ENGINE

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 9). To facilitate break-in, avoid prolonged periods of engine idling for the first 100 hours of service.

GASOLINE ENGINES

During the first 20 hours of service, operate the gasoline engine at half load with the hand throttle in the 2100 rpm load speed position (page 9). At half load, the engine speed will be approximately 2250 rpm. During the break-in period, it is not recommended to use the foot throttle or to place the hand throttle in speeds above the 2100 rpm load speed position.

# OPERATING THE TRACTOR

## SEAT


*Seat Controls*

The deluxe, foam-padded suspension seat is equipped with a steel compression spring and shock absorber to provide "Float-Ride" comfort. The semi-circular lower backrest and flexibly mounted upper backrest add to the operator's comfort and safety.

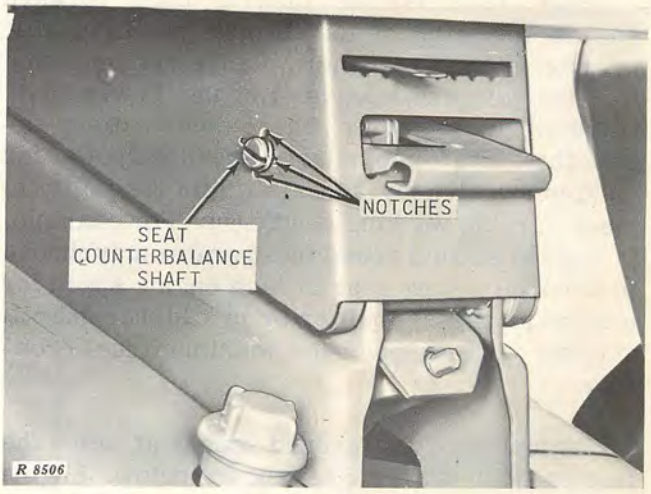
Use only warm water and mild soap to clean the seat cushions. NEVER USE SOLVENTS.

### MOVING SEAT TO UPPER REAR POSITION

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

### 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 position 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.




*Seat Counterbalance Shaft*

### ADJUSTING FOR WEIGHT OF OPERATOR

You can adjust the tension of the steel compression spring to conform to your weight. This results in the proper amount of comfort and enables the seat to "float" when traveling over rough ground. To make this adjustment, turn the weight-adjusting screw clockwise or counterclockwise until the indicator on the left-hand side of the seat conforms to your weight.

### ADJUSTING COUNTERBALANCE SPRING

If the seat does not move fully to the rear when unlatched, adjust the counterbalance spring as follows. Move the seat to the upper rear position. Insert a screwdriver in the slot in the counterbalance shaft, push in to unlatch the shaft, and turn the shaft counter-clockwise. Align the latch in the end of the shaft with one of the pairs of slots in the side of the seat support and pull the screwdriver outward to latch the shaft.

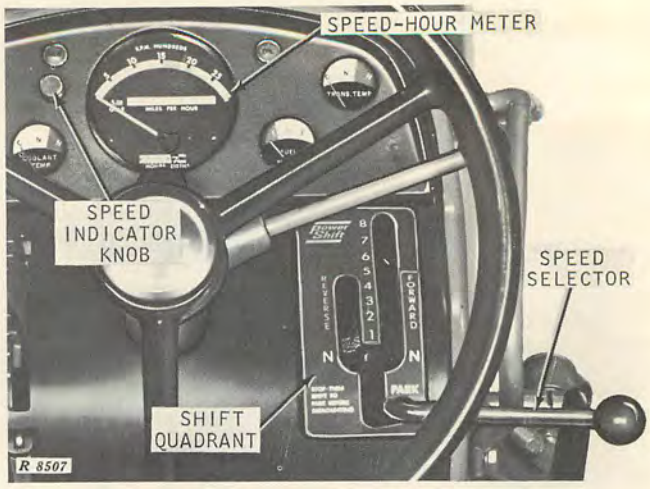
## SELECTING GROUND SPEED

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. 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.

*NOTE: The ground speeds shown in the chart below are for Row-Crop tractors with 13.6-38 rear tires that have a loaded radius of 28.5 inches. Hi-Crop tractors have similar ground speeds.*

**TRACTOR GROUND SPEEDS IN MILES PER HOUR**

| Gear | 1500 Rpm | | *2100 Rpm | | 2500 Rpm | |
|---|---|---|---|---|---|---|
| | Syncro-Range | Power Shift | Syncro-Range | Power Shift | Syncro-Range | Power Shift |
| 1st | 1.1 | 1.0 | 1.5 | 1.4 | 1.8 | 1.7 |
| 2nd | 1.7 | 1.4 | 2.4 | 2.0 | 2.8 | 2.4 |
| 3rd | 2.2 | 2.2 | 3.1 | 3.1 | 3.6 | 3.7 |
| 4th | 2.8 | 2.9 | 3.9 | 4.0 | 4.7 | 4.8 |
| 5th | 3.5 | 3.7 | 4.8 | 5.1 | 5.7 | 6.1 |
| 6th | 4.6 | 4.7 | 6.5 | 6.7 | 7.7 | 7.9 |
| 7th | 5.8 | 6.3 | 8.1 | 8.8 | 9.6 | 10.5 |
| 8th | 9.5 | 10.5 | 13.2 | 14.7 | 15.8 | 17.5 |
| 1st reverse | 2.1 | 1.2 | 3.0 | 1.6 | ..... | ..... |
| 2nd reverse | 3.3 | 1.7 | 4.7 | 2.3 | ..... | ..... |
| 3rd reverse | .... | 2.6 | ..... | 3.6 | ..... | ..... |
| 4th reverse | .... | 3.3 | ..... | 4.7 | ..... | ..... |

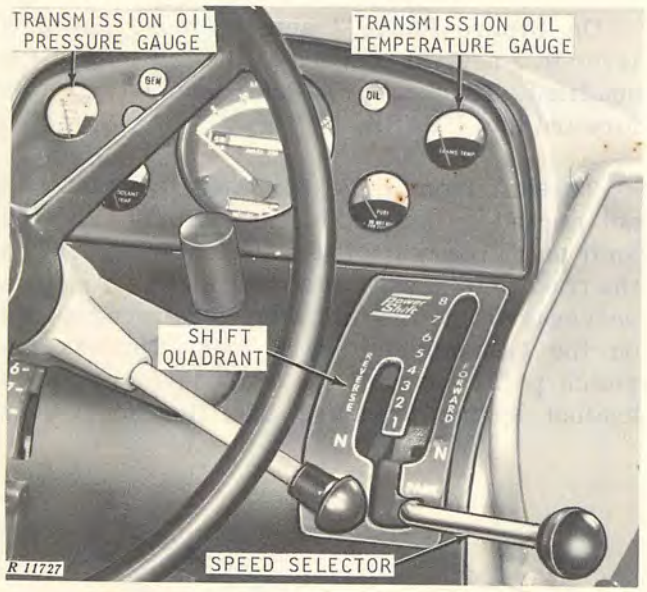
**2100 engine rpm gives the SAE rated 540 or 1000 rpm PTO speed. Some PTO-driven implements are operated at other speeds. See the implement operator's manual for detailed instructions.*

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 a Power Shift transmission, check the transmission oil pressure gauge and the transmission oil temperature gauge 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 64. Also check for proper transmission-hydraulic oil level. If necessary, fill the system to the proper level. See page 52. 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.

When operating the engine at 2200 rpm, the indicator hand on the transmission oil pressure gauge should be to the right of the minimum transmission pressure line.

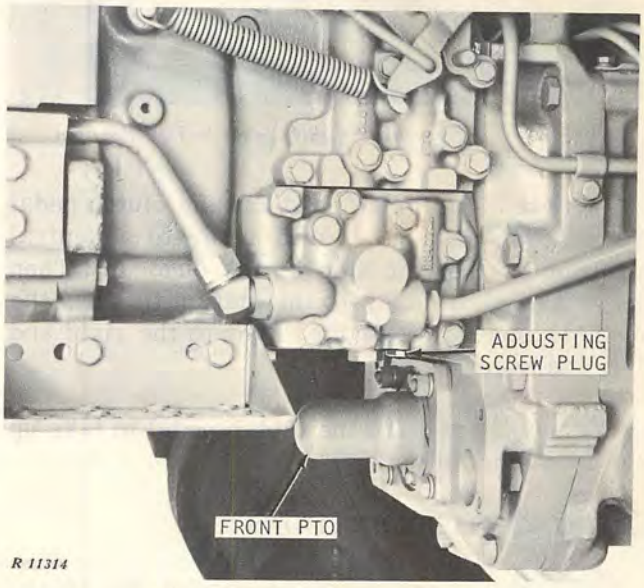
The minimum, safe transmission oil pressure will decrease in proportion to engine speed below 2200 rpm. If the pressure is questionable, check it by momentarily running the engine at 2200 rpm.

If the gauge indicates low oil pressure, stop the tractor and check the transmission oil level (see page 52). If the oil level is in the "SAFE" range, the transmission-hydraulic system filters may be clogged and need replacing. See page 54. If this does not correct the difficulty, call your John Deere dealer.

**CAUTION: Do not operate the tractor when the transmission oil temperature is too high or the oil pressure is too low.**

SHIFT ADJUSTMENT

The transmission speed-of-shift may be adjusted for rapid shift or for slow, smoother 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.

## SYNCRO-RANGE TRANSMISSION

### SHIFTING BETWEEN STATIONS

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


*Syncro-Range Transmission Shift Lever in TOW Position*

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.

### 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, 2rd 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.

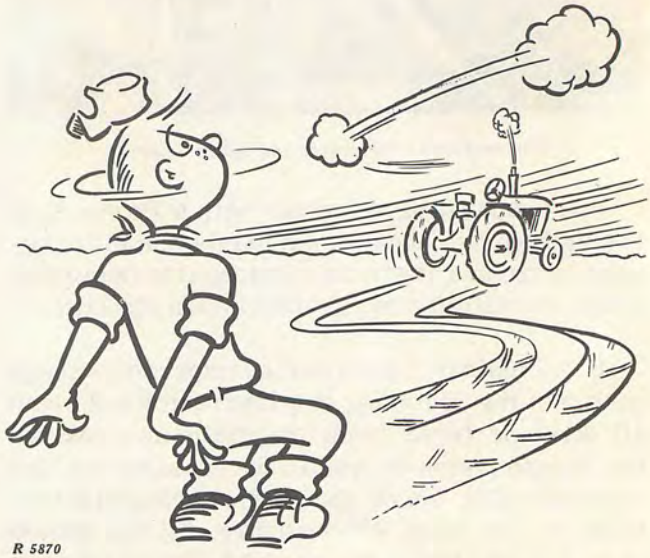
## PARKING THE TRACTOR

**CAUTION: Be sure the tractor is stopped before placing the shift lever or speed selector in the "PARK" position.**

### SYNCRO-RANGE TRACTORS

On Syncro-Range tractors, move the shift lever to a neutral position at the left side of the quadrant. Then push the shift lever all the way forward into "PARK."

To shift from "PARK" when the tractor is not 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 the load on the transmission park lock. Depress the clutch pedal and pull the shift lever rearward against spring pressure into the No. 1 shift




**CAUTION: Whenever the tractor is stopped, place the shift lever or speed selector in the "PARK" position BEFORE DISMOUNTING. Never dismount from the tractor when it is in motion.**

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."

POWER SHIFT TRACTORS

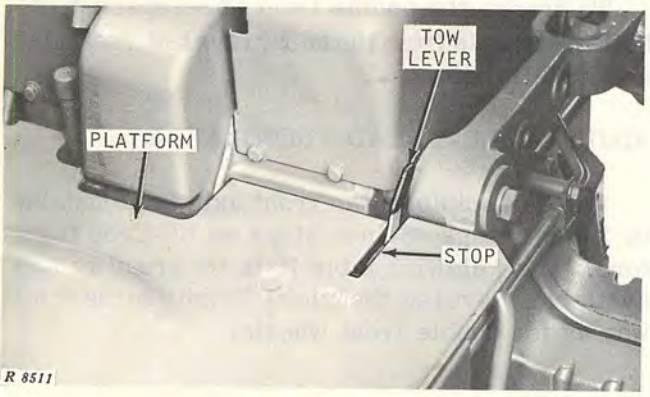
On Power Shift tractors, move the speed selector rearward and to the right into the "PARK" position shown in the illustration on page 13. Shifting from "PARK" to neutral releases the park locking action.

## TOWING THE TRACTOR

**CAUTION: Never tow the tractor at high speeds. Always attach a tow bar or chain to the tractor frame. When possible, run the engine to maintain hydraulic pressure for power operation of steering and brakes.**

POWER SHIFT TRACTORS

When towing a tractor with a Power Shift transmission, move the tow lever to the center of the tractor and forward around the stop until it locks in the "TOW" position. Place the speed selector in the neutral "N" position.




*Tow Lever on Power Shift Tractor*

When moving the lever out of the "TOW" position to operate the tractor, place the speed selector in "PARK" and move the tow lever rearward, around the stop until the lever locks in the rearward position. If tow lever will not move all the way rearward, start the engine while applying pressure rearward to the lever.

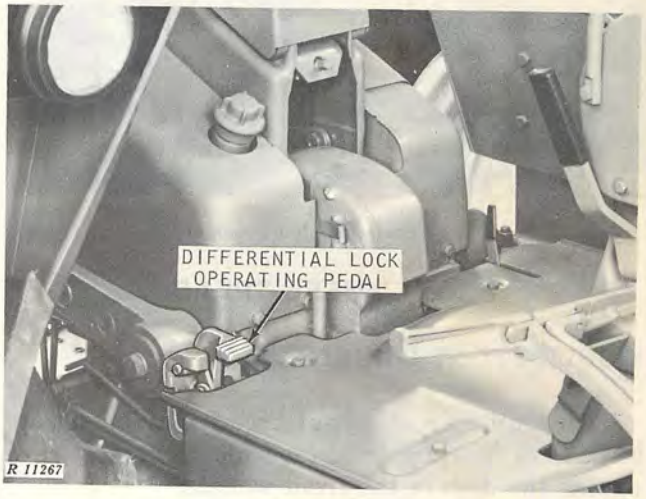
**CAUTION: To prevent transmission damage, always place the tow lever in "TOW" position when towing Power Shift tractors. Do not tow the tractor to start the engine.**

SYNCRO-RANGE TRACTORS

The shift quadrant for the Syncro-Range transmission has a "TOW" position. Whenever a Syncro-Range tractor is to be towed, move the shift lever to this position.

## DIFFERENTIAL LOCK

Your tractor may be equipped with a differential lock that will turn both rear wheels at the same speed. This prevents the usual loss of power when one wheel is slipping.




*Differential Lock Operating Pedal*

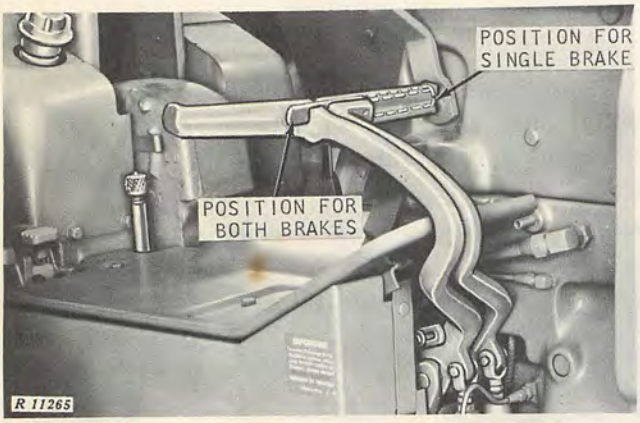
When one wheel starts to slip or whenever desired, engage the differential lock by depressing the operating pedal located at the right-rear side of the platform. When no longer required and before turning the tractor, disengage the differential lock by depressing one or both brake pedals. The front wheels should be in the straight ahead position when disengaging the differential lock.

**CAUTION: Do not operate the tractor at high speeds or attempt to turn the tractor with the differential lock engaged.**

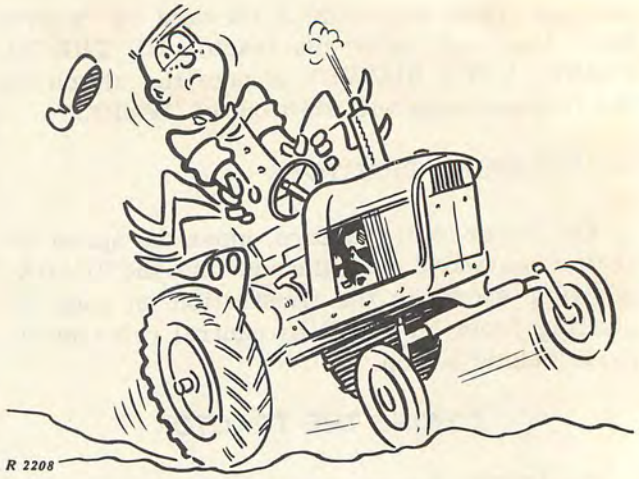
## POWER STEERING AND BRAKES

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*

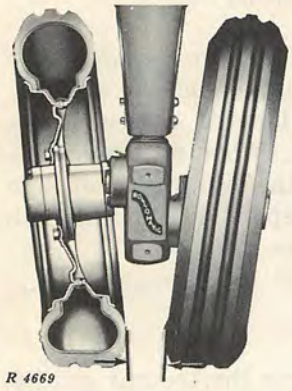



**CAUTION: Fast driving causes many accidents. Couple the brake pedals together and always drive at a safe speed.**

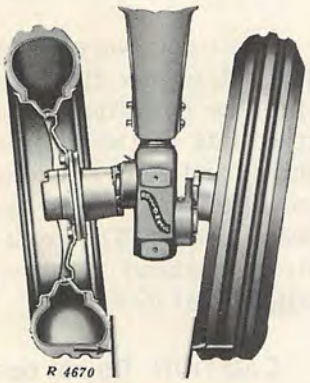
## FRONT WHEEL TREAD

### 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*

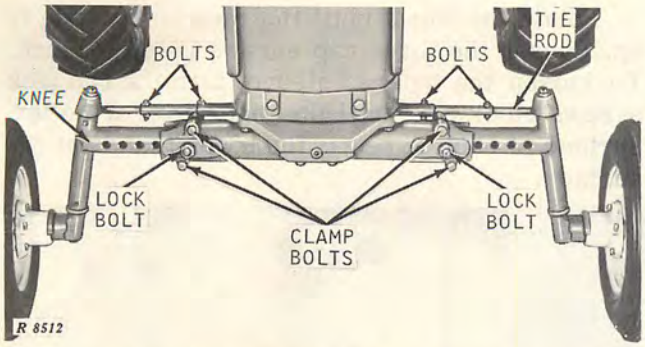
For ease in steering and clearance for front-mounted implements, dish the wheels inward as shown in the illustration. For listed crops where the front wheels are operated on a ridge or for muddy operating conditions where mud has a tendency to "ball up" between the wheels, set the wheels to the wide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

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

### ADJUSTABLE-TREAD FRONT AXLE

The adjustable-tread front axle is adjustable in 2-inch steps (6-inch steps on Hi-Crop tractors). The following table lists the tread ranges available. Reverse the wheel "dish" in the same way as for double front wheels.

| Tractor | Wheels Dished In | Wheels Dished Out |
|---|---|---|
| Row-crop: | 48-1/2" to 72-1/2" | 58-1/4" to 82-1/4" |
| Hi-Crop | 60" to 84" | 65-1/4" to 89-1/4" |

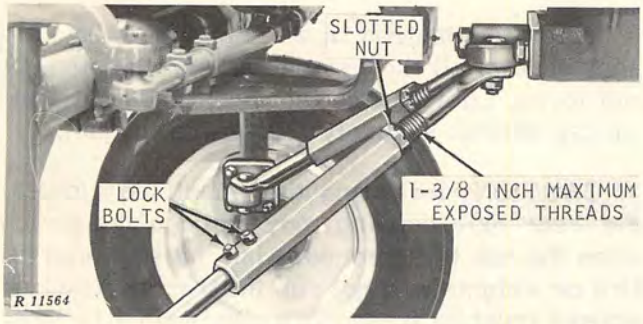



*Front Wheel Tread Adjustment (Row-Crop Tractor Illustrated)*

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

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

On Hi-Crop tractors with radius rods, loosen the slotted nuts away from the couplings and remove the radius rod coupling lock bolts.

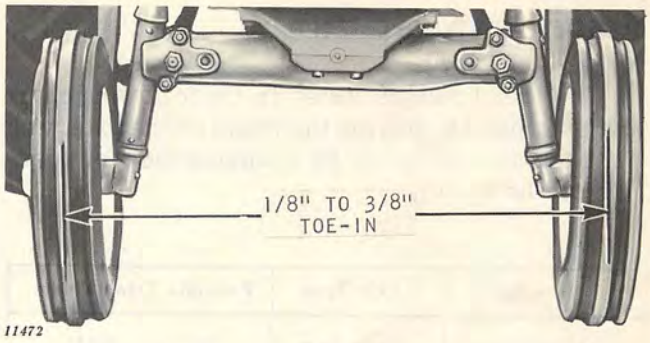



*Hi-Crop Radius Rods (Special Equipment)*

Loosen the clamp bolts and drive 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 bolts securely (to 300 ft-lbs torque). Coat unpainted surfaces with rust preventive or heavy grease. Check toe-in.

On Hi-Crop tractors with radius rods, adjust the couplings so that the lock bolt holes are aligned. Install the lock bolts and tighten the slotted nuts. The exposed threads on the radius rods must never exceed 1-3/8 inches.

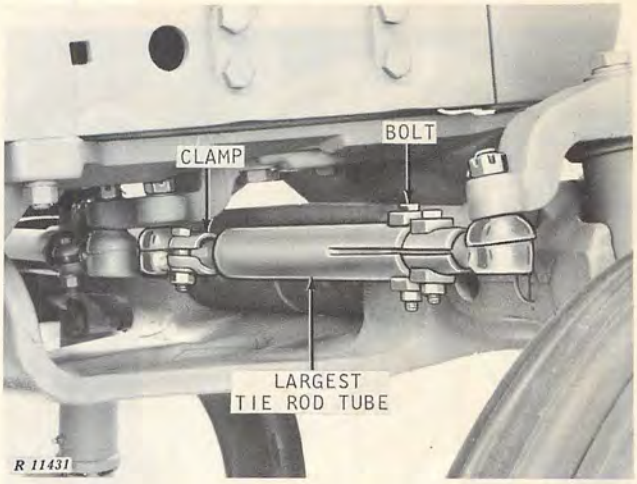
## TOE-IN ADJUSTMENT




*Correct Toe-In*

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*

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.

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

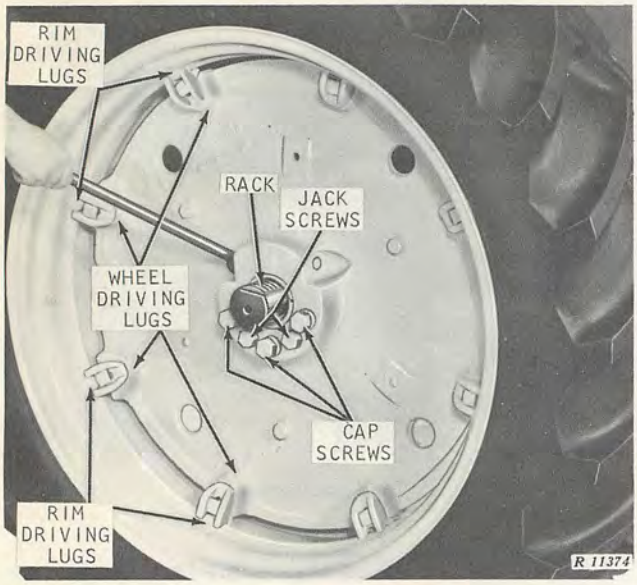
### RANGE OF ADJUSTMENT

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

| Tractor | Axle Type | Possible Tread Widths |
|---|---|---|
| Row-crop | Regular | 56" to 88" |
| | Long | 56" to 104" |
| Hi-Crop | Rack | 73" to 97" |
| | Flanged | 60" to 98" |

### 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. The rack and pinion adjustment may be made with one or two wheel weights installed. Remove any additional weights.




*Rack and Pinion Adjustment*

Rotate the wheel until the rack on the axle is up. Loosen the three cap screws 1/4 to 3/8 inch. To loosen the tapered sleeve, turn the two jack screws clockwise until the inner edge of the hex. surface of each screw is flush with the wheel hub surface.


*Center of Tractor*

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 wheels are correctly spaced.

After the desired tread is obtained, back the jack screws all the way out against the stop. Do not force. Lubricate cap screw threads and tighten cap screws securely (300 ft-lbs torque).

**CAUTION: Adjusting the wheel too close to the rear axle housing may damage the pinion when the hub is tightened. Also, be sure that the tire or weights will 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 service, RETIGHTEN cap screws and keep them tight.

### CHANGING RIM POSITION ON WHEEL

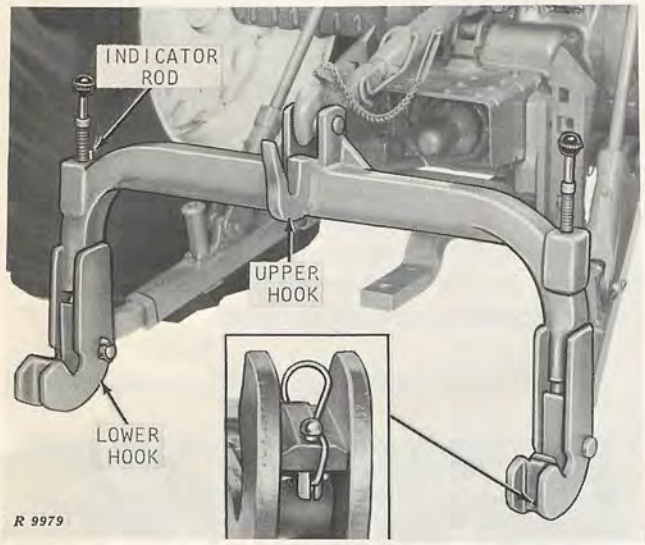
The rim is held to the wheel by clamps that engage one of the two raised rings around the inside of the rim. Tread adjustment may be ac-

QUIK-COUPLER

The Quik-Coupler provides a fast, easy means for attaching an integral category 2 implement to the Universal 3-Point Hitch without getting off the tractor. The Quik-Coupler, adapters, and latch lock pins are available from your John Deere dealer.

*Installing Quik-Coupler on 3-Point Hitch*

With an implement mast ball installed on the Quik-Coupler, install the coupler on the 3-point hitch draft links and center link as shown.




*Quik-Coupler*

*Attaching Implement to Quik-Coupler*

Install the two adapters or special adapters which are used with the Quik-Coupler on the ends of the implement hitch pins, with the large part outward. Secure the adapters in place with the roll pins provided.

With the spring-loaded latches on the coupler in the upper position (up and toward the front), back the tractor to the implement until the upper hook is behind the mast pin and between the sides of the implement mast. Raise the rockshaft. As the implement is raised by the coupler, the spring-loaded latches lock the implement to the coupler.

**CAUTION: When the spring-loaded latches are properly locked, the indicator rods will protrude through the slots in the coupler frame adjacent to the latch rods.**

To prevent accidental disconnecting of semi-integral implements that have a rotary motion of the adapters in the lower hooks, install latch lock pins as shown in the illustration inset. When the lock pins are not in use they can be stored at the top of the coupler frame latches.

*Removing Implement from Quik-Coupler*

To remove most implements, raise the rockshaft far enough to reach the spring-loaded latches. Push both latches downward and rearward to lock them in the disconnect position. Lower the implement to the ground.

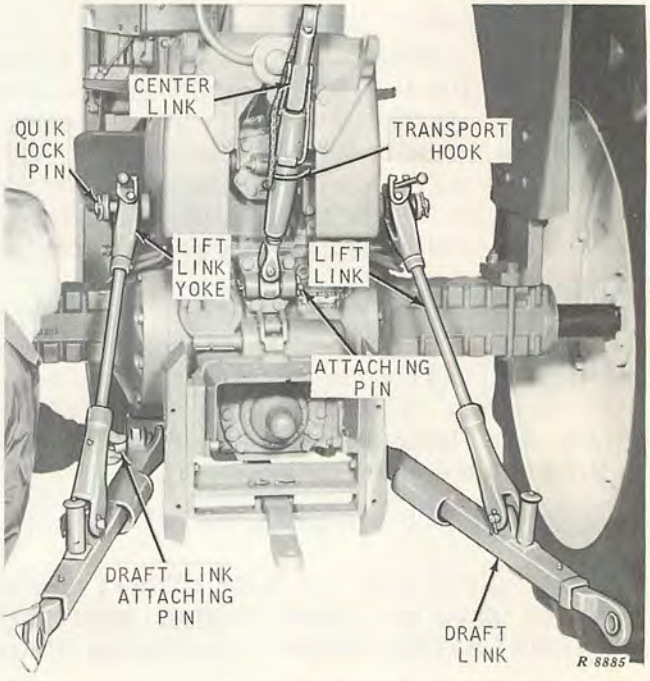
Continue lowering hitch and coupler until the coupler hooks clear the implement mast and hitch pin adapters. Drive the tractor forward away from the implement.

*NOTE: Do not attach a towed load to the 3-point hitch and Quik-Coupler. A drawn implement should be hitched to the drawbar only.*

REMOVING THE UNIVERSAL 3-POINT HITCH

The Universal 3-Point Hitch can be removed, when necessary, as follows:

Detach the front end of each draft link from the tractor by removing the "Quik-Lock" pins and pulling out the draft link attaching pins.

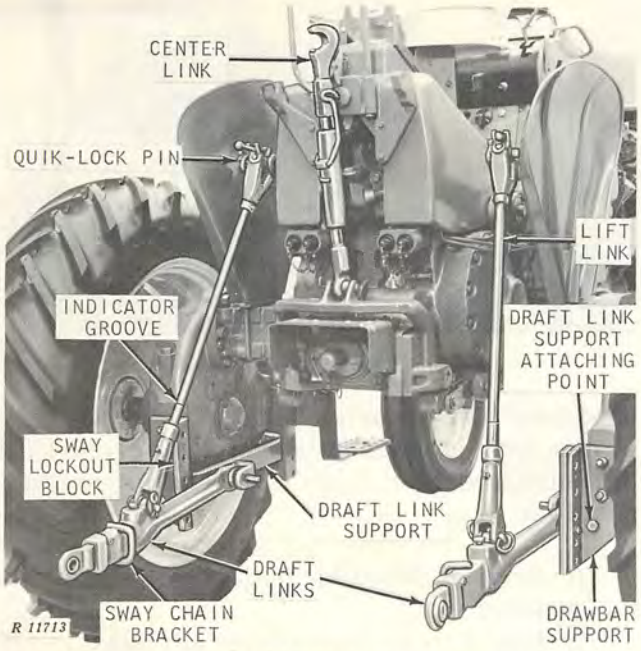



*Removing 3-Point Hitch*

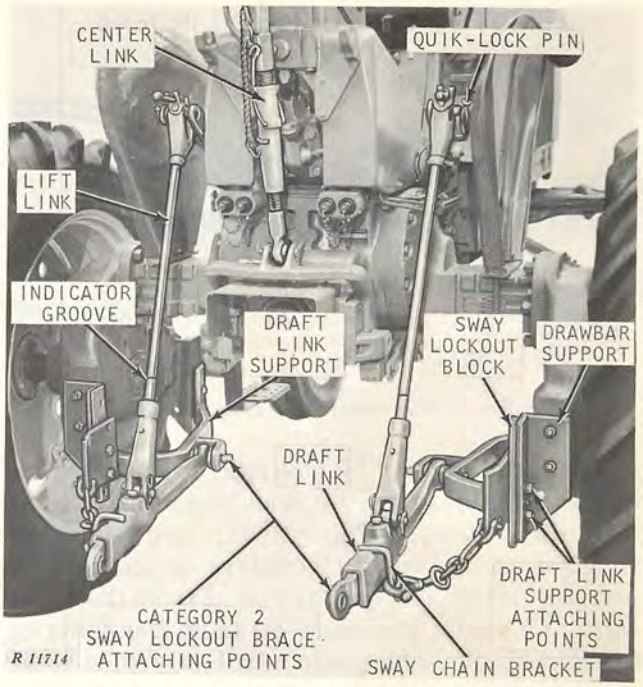
Detach the top end of each lift link from the rockshaft arms by removing the "Quik-Lock" pins and bushings from the outside boss of the rockshaft lift arms. Then force each lift link yoke to the outside. This permits the draft links and lift links to be removed.

Detach the center link from the tractor by removing the "Quik-Lock" pin and pulling out the center link attaching pin. Then pull the center link out of the transport hook to remove the center link from the tractor.

## HI-CROP 3-POINT HITCH




*Hi-Crop 3-Point Hitch for Wide Clearance Implement*




*Hi-Crop 3-Point Hitch for Modified Category 1 or Category 2 Implement*

The Hi-Crop 3-point hitch provides a fast, easy means of attaching integral implements such as cane tool implements, tool carriers, and modified category 1 and category 2 implements with 29 or 30 inch mast.

### INSTALLING 3-POINT HITCH

If the drawbar frame is installed, remove it. Support the heavy drawbar frame when removing the four attaching bolts. Leave the sway lockout blocks installed on the drawbar supports.

If a wide clearance implement is to be used, install the wide clearance implement draft link supports between the front and rear drawbar supports. Attach the draft links to the draft link supports with the sway chain brackets to the inside as shown in the left-hand illustration.

If a modified category 1 or 2 implement is to be used, install the category 1 or 2 draft link supports in the second and third holes up in the drawbar supports. Install the draft links with the sway chain brackets to the outside. Connect the sway chains to the draft links and to the lower holes in the draft link supports as shown in the right-hand illustration.

Attach the upper ends of the lift links to the rockshaft lift arms with the adjusting handles to the rear. Attach the center link to the tractor.

### ATTACHING IMPLEMENTS TO 3-POINT HITCH

When attaching implements to the Hi-Crop 3-point hitch, use the following instructions and most of the instructions given on pages 26 through 29.

The PTO master shield may have to be removed. See the implement operator's manual.

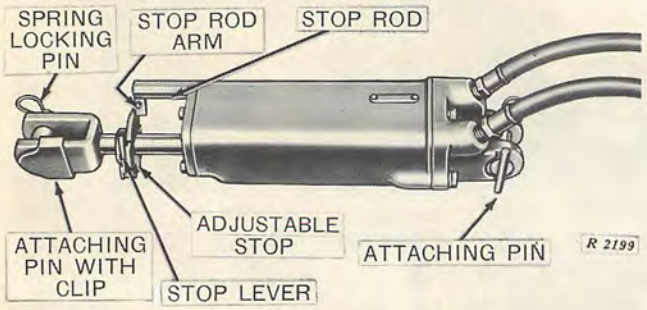
Attach the draft link and center link to the implement. To attach wide clearance implements, the sway lockout blocks may have to be removed.

After the implement is attached, slowly raise it to transport position and check for interference. On category 1 and 2 implements, sway chains are connected to lower hole of draft link support. Adjust the sway chain length to permit only a slight amount of sway when raised.

To eliminate all the side sway on category 2 implements, install the sway lockout brace between the right-hand implement hitch pin and the left-hand draft link attaching pin. Install lockout brace on implement hitch pin first then install the draft link.

Adjust the lift links and the center link. Hi-Crop lift link length is 41-3/16 inches with the indicator groove 1-1/4 inches above the lift link body. Lift link range of adjustment is 40 to 42-1/2 inches. Range of adjustment for the center link is 22 to 27 inches.

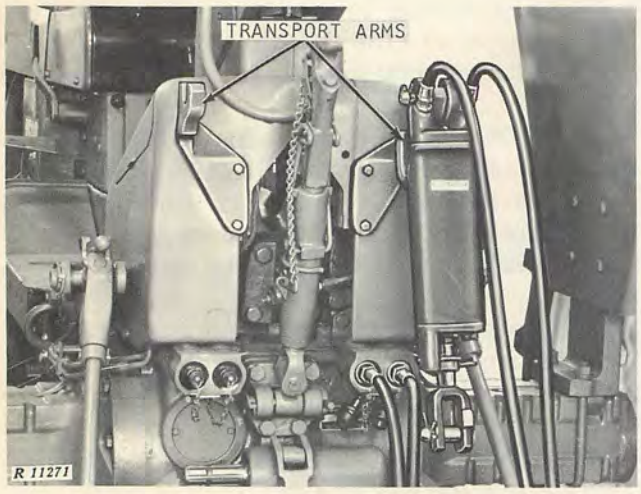
## REMOTE HYDRAULIC CYLINDERS




*Hydraulic Stop Remote Hydraulic Cylinder*

Your tractor may be equipped to operate one or two single-acting or double-acting remote hydraulic cylinders. The cylinders are connected by hoses to breakaway couplers at the rear of the tractor and are operated by oil from the main hydraulic pump. Pressure oil from the pump is directed by the selective control valves, located under the hood, to the breakaway couplers. The two remote cylinders may be operated individually or simultaneously.

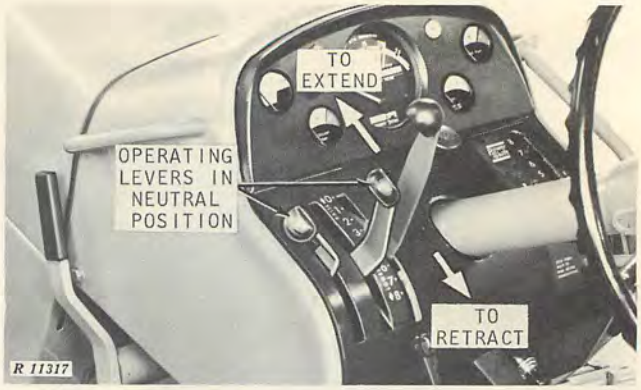
When not in use, the remote cylinders can be stored on the transport arms at the rear of the tractor.




*Remote Cylinder on Transport Arm*

### USING REMOTE CYLINDER OPERATING LEVERS

Tractors equipped to operate one remote hydraulic cylinder have a remote cylinder operating lever located outside of the rockshaft control lever. Tractors equipped to operate two remote cylinders have two remote cylinder operating levers side by side. The inner lever operates the remote cylinder attached to the right-hand breakaway coupler, and the outer lever operates the cylinder attached to the left-hand breakaway coupler. Each lever has six operating positions:




*Remote Cylinder Operating Levers*

*(1) Neutral.* Move lever to center position in the quadrant.

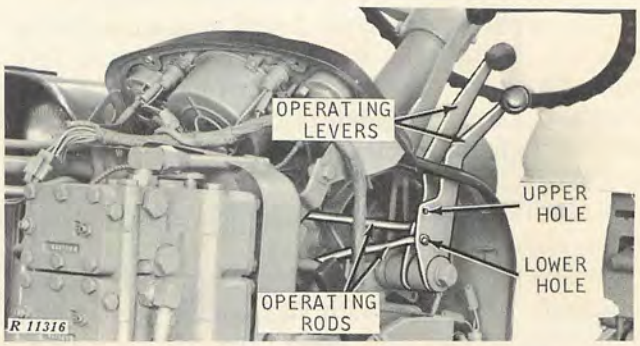
*(2) Slow Extend.* Move lever slightly forward from neutral. The lever must be held until the desired adjustment is reached. In most applications, this will raise the implement.

*(3) Fast Extend.* Move lever all the way to the front. The lever will remain in this position until the end of the piston stroke when it will automatically return to the neutral position.

*(4) Slow Retract.* Move lever slightly toward the rear from neutral. The lever must be held until the desired adjustment is reached. In most applications, this will lower the implement.

*(5) Fast Retract.* Move lever rearward to the first lock position. The lever will remain in this position until the end of the piston stroke when it will automatically return to the neutral position.

*(6) Float.* In addition, after making a simple adjustment, each lever may be moved all the way rearward in the quadrant to a float position to permit the implement to follow the ground contour. The lever will lock in the float position until pushed forward to a new position.

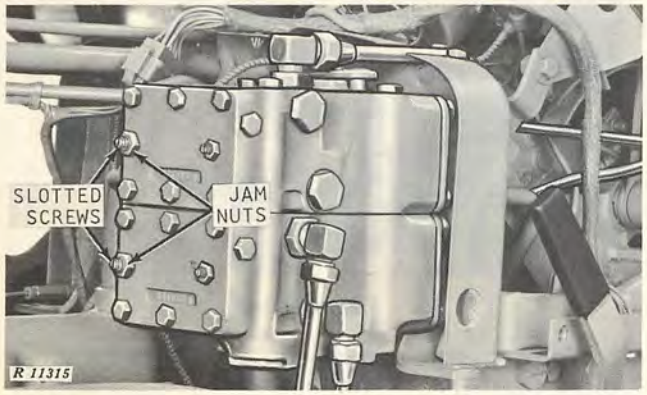



*Remote Cylinder Operating Lever Adjustment*

To obtain float position, remove the cowl (page 57) and move the operating rod shown in the illustration on page 32 to the upper hole in the operating lever. Replace the cowl. Move the operating rod back to the lower hole when float position is no longer desired.

## ADJUSTING RATE OF OPERATION

The maximum rate of operation for each remote cylinder can be increased or decreased by adjusting the selective control valve. This adjustment controls the maximum flow of oil to a double-acting remote cylinder during both the raising and lowering of the implement.



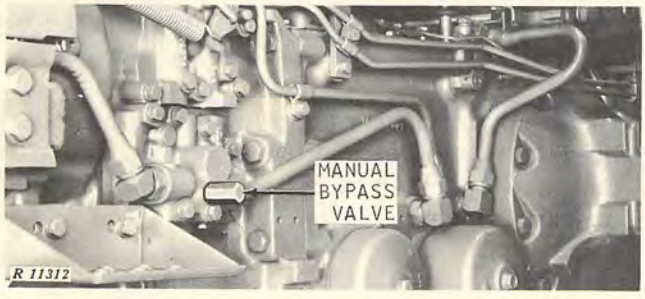

*Selective Control Valves*

To make the adjustment, remove the left-hand side shield, reach up under the hood, loosen the jam nut, and turn the slotted screw on the selective control valve clockwise to decrease the rate of operating or counter-clockwise to increase it.

**CAUTION: Full extension or retraction of a 2-1/2 x 8-inch remote cylinder should require at least 2 to 2-1/2 seconds. Faster speeds may cause damage.**

The upper valve controls the remote cylinder connected to the right-hand breakaway coupler and the lower valve controls the cylinder connected to the left-hand coupler.

## MANUAL BYPASS VALVE (Power Shift Tractors Only)

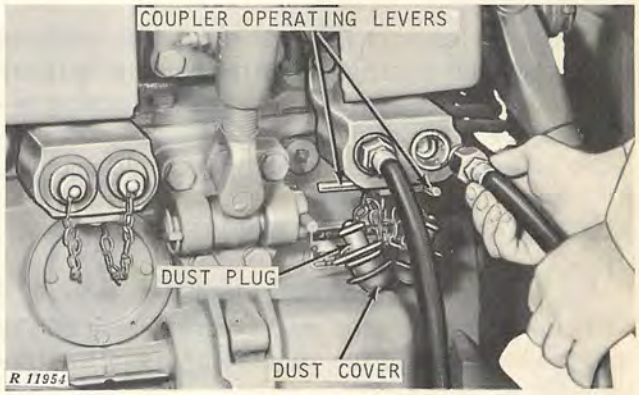



*Manual Bypass Valve on a Power Shift Tractor*

To assist lowering of single-acting cylinders, Power Shift tractors have a manual bypass valve located on the left-hand side of the tractor. When using single-acting cylinders, open the valve by removing the cap and unscrewing the valve five turns. Replace the cap making sure that the valve does not turn when screwing cap on.

**CAUTION: When not using single-acting cylinders, close the manual bypass valve by turning it clockwise as far as it will go.**

## CONNECTING HOSES TO BREAKAWAY COUPLERS




*Connecting Remote Cylinder Hoses*

Breakaway couplers at the rear of the tractor are used to couple or uncouple remote cylinder hoses under pressure without loss of oil, regardless of whether or not the tractor engine is running. They also safeguard the hoses by permitting them to be pulled loose from the tractor without damage if a drawn implement should become disconnected from the tractor.

Remove the dust plugs and store them on the spring clips under the breakaway coupler. Remove the dust covers from the hose ends and store them on the coupler dust plugs. Always be sure the hose ends and the coupler receptacles are free from dirt before connecting the hoses.

Insert the hose from the stop rod side of the cylinder into the left-hand receptacle of the coupler. After the hoses are properly attached, move the coupler operating levers until they are at a right angle to the hoses. This lifts and valves in the hose end and the receptacle off their seats and permits oil to flow.

When the remote cylinder operating lever is pushed forward, the implement will normally rise if the hoses are properly attached.

## BLEEDING REMOTE CYLINDER

If the hoses have been disconnected from the remote hydraulic cylinder, or if a new cylinder or one that has been out of service is installed, all trapped air must be removed after the hoses

are connected to the breakaway coupler. Place the cylinder with the hose end up. Start the engine and move the remote cylinder operating lever back and forth seven or eight times to bleed the air from the cylinder.

ATTACHING REMOTE CYLINDER TO IMPLEMENT

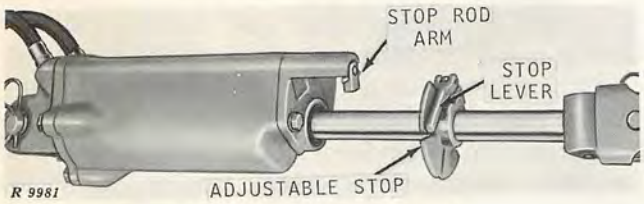
To install a remote hydraulic cylinder on most implements, remove the spring locking pins and pull the attaching pins. Set the cylinder in place and install the attaching pins and locking pins.

Many implements have a locking device to hold it in transport position when the remote cylinder is removed. Be sure to disengage the locking device before attempting to operate the remote cylinder. See your implement operator's manual.

ADJUSTING REMOTE CYLINDER STOP

The remote hydraulic cylinder is equipped with an adjustable stop so that its working stroke may be adjusted to the requirements of the implement.

*Hydraulic Stop Remote Cylinder*




*Hydraulic Stop Remote Cylinder*

The total fast retract stroke may be varied from 0 to 8 inches. After the adjustable stop contacts the stop rod arm, from 0 to 1-1/2 inches of slow travel may be gained by holding the remote cylinder operating lever in the retract position.

To adjust the piston stroke, lift the stop lever and slide the adjustable stop along the piston rod to the desired position. Press the stop lever down to clamp the stop securely on the rod. If the stop does not clamp securely, lift the stop lever and rotate it clockwise before locking it in place.

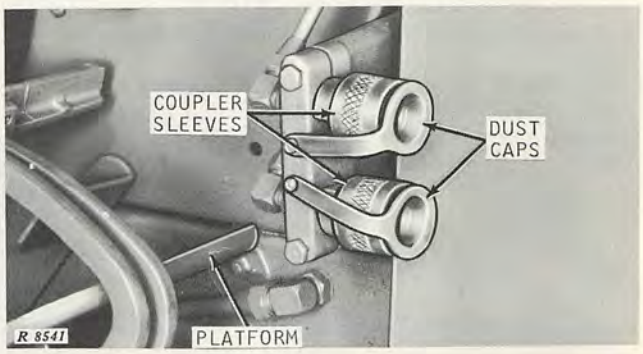
*NOTE: Be sure that the adjustable stop is clamped securely and is positioned so that the stop lever will not contact the stop rod arm.*

REMOVING HOSES FROM BREAKAWAY COUPLERS

To remove a remote cylinder hose from the breakaway coupler, pull the hose straight rearward from the coupler. The coupler lever will automatically move to the rearward position.

After the remote cylinder hoses are removed, insert the dust plugs in the receptacles and place the dust cups on the hose ends.

## FRONT COUPLERS




*Front Couplers*

Your tractor can be equipped with front couplers that are located ahead of the operator's platform on each side of the tractor.

To connect remote cylinder hoses to the front couplers, remove the dust caps and clean all dirt from the couplers and the hose ends. Slide the coupler sleeve backward, insert the hose in the coupler, and allow the sleeve to slide forward and lock the hose to the coupler.

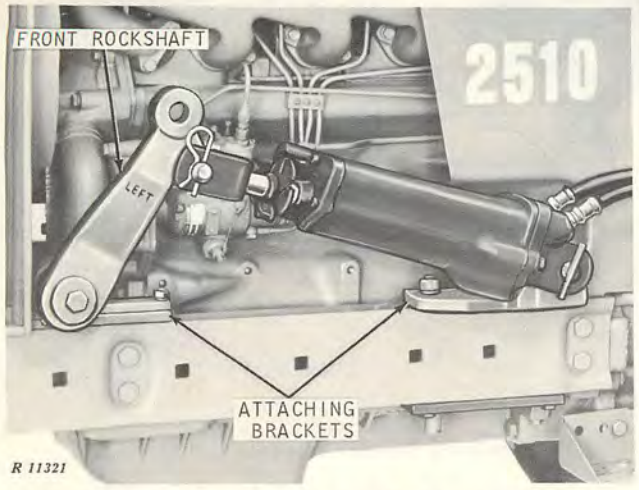
Connect the hose from a single-acting cylinder or the hose from the stop rod side of a double-acting cylinder to the top coupler.

To facilitate connecting or disconnecting the hoses, relieve the pressure on the coupler by stopping the engine and moving the remote cylinder operating lever back and forth.

If it is difficult to insert the hoses, relieve the remote cylinder pressure by pressing the ball in the hose end against a clean flat surface.

Do not connect remote cylinders to both the breakaway coupler and the front couplers so that they are operated by the same remote cylinder operating lever.

## FRONT ROCKSHAFT

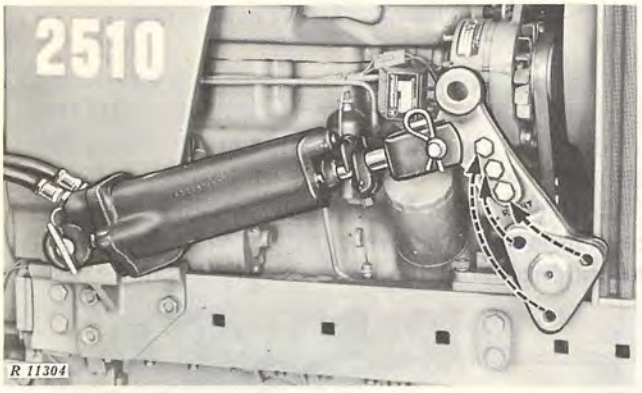



*Front Rockshaft with One Remote Cylinder Mounted on Left-Hand Side for Simultaneous Lift Arm Operation*

Your tractor may be equipped with a front rockshaft which permits raising and lowering of the front rigs of cultivators and similar equipment independent of the rear rigs which are controlled by the rear rockshaft. In addition, front rigs can be raised and lowered independently when two remote cylinders are mounted on the front rockshaft.

The double-acting hydraulic stop remote cylinders which operate the front rockshaft are controlled by the remote cylinder operating levers.

After working depth of the front rigs have been established, the depth can be maintained by setting the adjustable stops on the hydraulic stop remote cylinders. Then, the front rigs will return to the preset depth after having been raised.




*Front Rockshaft Adjusted for Independent Lift Arm Operation*

### SIMULTANEOUS LIFT ARM OPERATION (One Cylinder)

One remote cylinder is used to raise or lower both of the lift arms simultaneously but independently of the rear rockshaft. The remote cylinder is mounted on the left-hand side of the tractor.

Be sure the bolts and cap screws are installed in the right-hand end of the rockshaft so that both arms work together.

### INDEPENDENT LIFT ARM OPERATION (Two Cylinders)

Two remote cylinders are used to raise or lower the front rockshaft lift arms independently of each other. Remove the bolts and cap screw from the right-hand end of the rockshaft and store them in the three holes provided on the rockshaft arm as illustrated. Install a cylinder on each side of the tractor. Connect both cylinders to the front rockshaft.

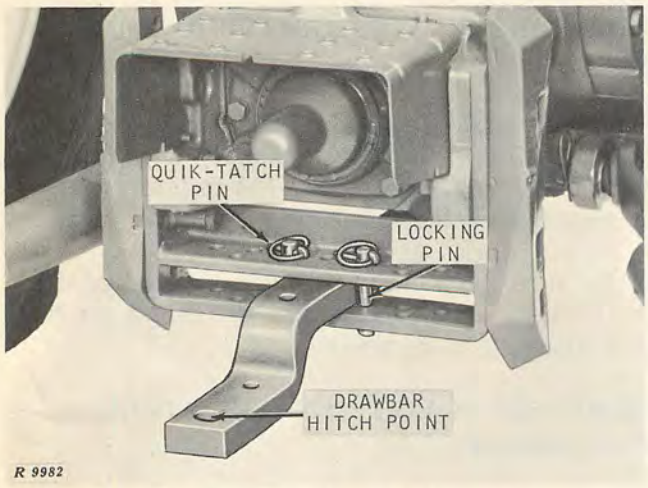
**CAUTION: Remote cylinder will be damaged if the piston rod end is placed in top hole of the front rockshaft arm.**

## DRAWBAR ASSEMBLY

The drawbar assembly is used to hitch all drawn implements to the tractor. Use the drawbar to pull towed loads only. Attach integral equipment to the 3-point hitch or to the 3-point hitch with hitch bar or Quik-Coupler.

*NOTE: Before attaching a load to the drawbar on row-crop tractor, place the selector lever in "D" (lower) position (page 26). Keep the lever in this position after the implement is attached.*

The drawbar assembly adjustments and the adjustments on most drawn implements enable the operator to obtain a correct line of draft which is essential to obtaining a minimum amount of rear wheel slippage and the full amount of drawbar pull without raising the front wheels.

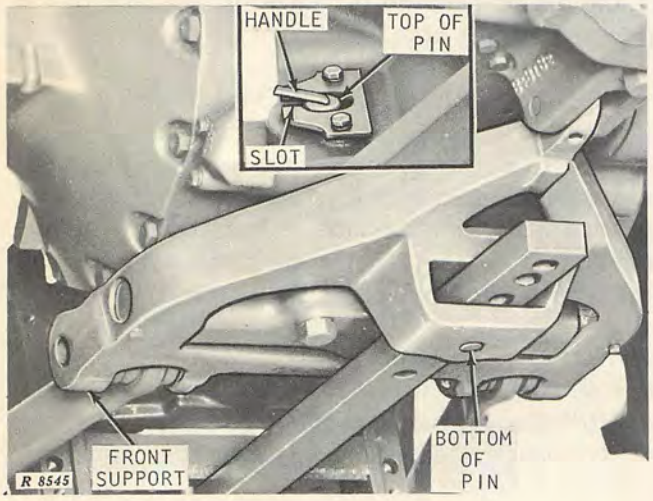



*Offset Drawbar Installed in Short, Low Position*

ROW-CROP TRACTORS

To change horizontal drawbar adjustment, move the locking pins and "Quik-Tatch" pins to another hole in the crossbar.

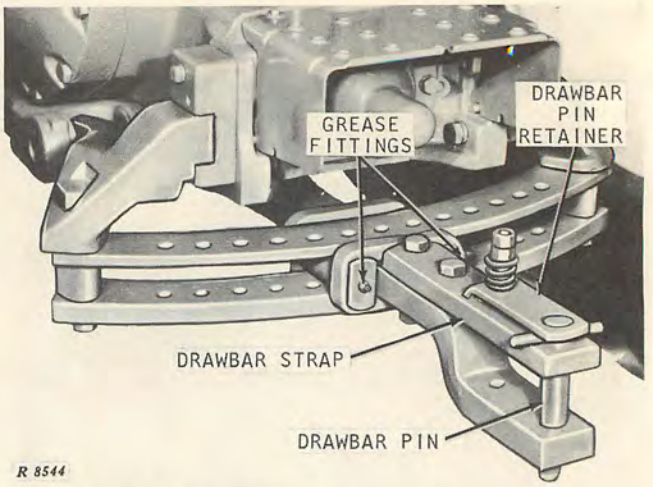
Vertical adjustment is made by turning the drawbar over. Make lengthwise adjustments by placing the drawbar pivot pin in another hole.




*Drawbar Pivot Pin*

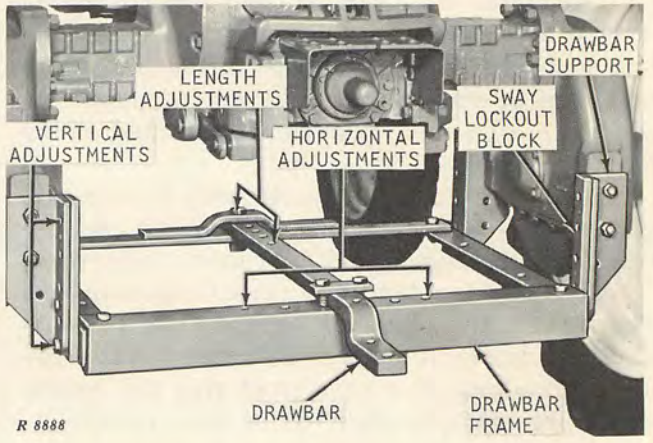
To remove the drawbar pivot pin, line up the pin handle with the slot on the front support. Lift up the pin and move the drawbar to the desired position. Drop the pin so the handle passes through slot in front support. Then turn the handle to lock the pin in position. To prevent injury, never put your finger in the drawbar pivot pin hole.

If your tractor is equipped with the special wide-swing drawbar assembly, a drawbar clevis consisting of a strap, drawbar pin, and pin retainer is furnished as regular equipment. These parts are used when the towed implement does not have a clevis. The strap is bolted to the drawbar. When the drawbar offset is up, the pin retainer is bolted on top of the drawbar. When the drawbar offset is down, the pin retainer is bolted on top of the strap.




*Wide-Swing Drawbar Assembly with Clevis*

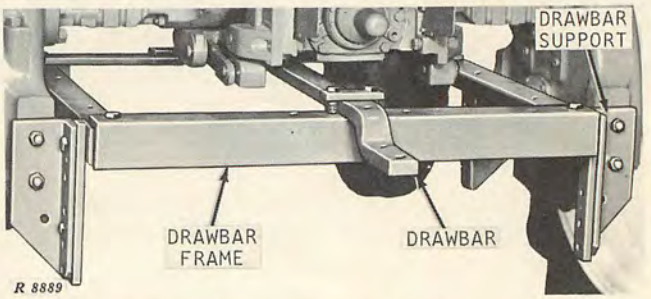
HI-CROP TRACTORS




*Hi-Crop Drawbar Frame in Low Position*

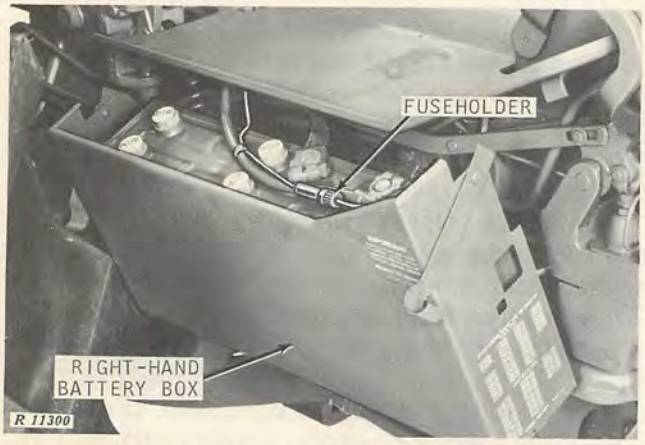
The Hi-Crop tractor drawbar may be adjusted vertically, horizontally, or lengthwise by bolting the drawbar or drawbar frame in the desired position.

**CAUTION: For heavy drawbar work, the drawbar frame must be in the low position. Intermediate and high positions are for light loads only.**




*Hi-Crop Drawbar Frame in High Position*

## FUSE AND CIRCUIT BREAKERS



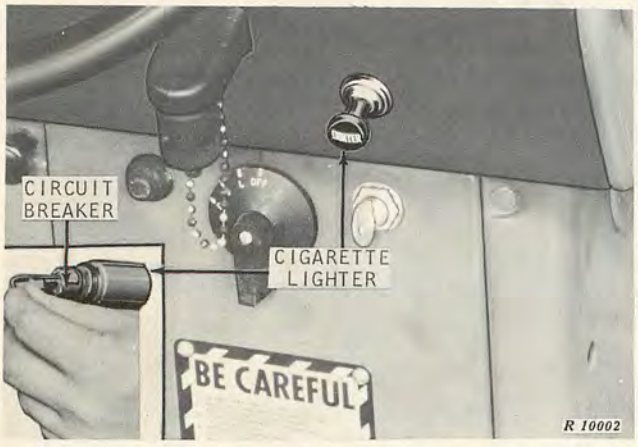

*Fuseholder in Electrical Outlet Socket Wiring*

The wiring for the electrical outlet socket is protected by an SFE 20-ampere fuse mounted in a fuseholder. The fuseholder is located above the battery inside the right-hand battery box. To replace this fuse, open battery box, unscrew the fuseholder and install a new fuse.

The wiring circuits for the lights and cigarette lighter are protected by separate 12-volt circuit breakers. If the lighting or cigarette lighter circuit becomes overloaded, a circuit breaker will open, preventing the lights or lighter from operating.

If the lights go out while the light switch is on, turn the light switch off and wait for 1 minute before turning the switch back on. The circuit breaker will reset itself. See your John Deere dealer if the lights fail to operate properly.

If the cigarette lighter fails to operate, the circuit breaker for its circuit may be open and must be reset before the lighter will operate. Remove the dash panel. Then insert a wire in the small hole at the rear of the lighter to reset the circuit breaker. If the lighter fails to operate after resetting the circuit breaker, or if the lighter fails intermittently, see your John Deere dealer.




*Cigarette Lighter Circuit Breaker*

## LIGHTS

### *Sealed-Beam Lamps*

The tractor may be equipped with either two or four sealed-beam headlights. On fenders with dual headlights, the inner lamps are sealed-beam head lamps and the outer ones are sealed-beam flood lamps. The tractor also has a combination rear lamp which consists of a sealed-beam unit to provide a bright flood light and a single-contact bulb which glows through the sealed-beam unit to provide a red taillight.

When replacing the red taillight, replace the bulb mounted on the inside of the taillight instead of the sealed-beam unit. Replace burned out or broken sealed-beam units according to the following specifications:

| 12 Volt Lamps | Mounting | Part No. |
|---|---|---|
| Inner head (2) | Fender | AF 3892R |
| Outer flood (2) | Fender | AR21059R |
| Head (2) | Hood | AF 3892R |
| Comb. (1) | Rear | AR21737R |

### *Bulbs*

Replace burned out or broken bulbs in the indicator lamps on the instrument panel, in the dash lamp, taillight, and flashing warning lamp in accordance with the chart below.

| Location | Contact | Color | Candle-Power | Part No. |
|---|---|---|---|---|
| Ind. lamps | Single | Red | 2 | R 30379R |
| Dash lamp | Single | White | 6 | AT12948T |
| Taillight | Single | White | 15 | AR21739R |
| Warning lamps | Single | White | 32 | AD 2062R |

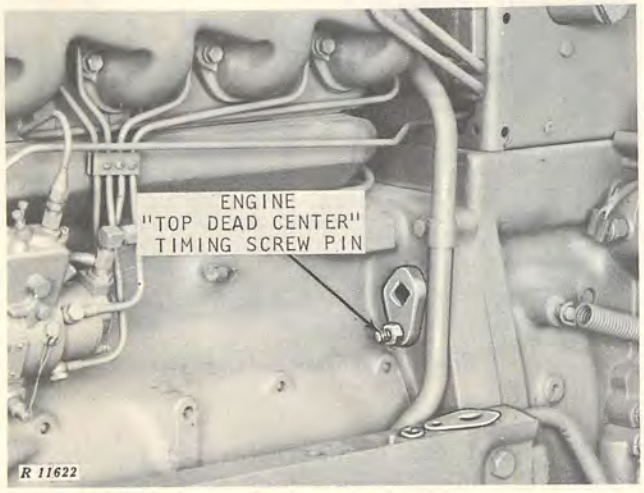
On Row-Crop tractors, the flasher unit (Signal Stat No. 170) for the warning lamp is in the lower end of the left rear fender brace. On Hi-Crop tractors, the flasher unit is in the wiring below the seat.

*NOTE: In some areas flashing lights are prohibited by local regulations. If necessary, disconnect the flasher unit and the short wire leading to it. Connect the warning lamp to the wiring harness (orange wire).*

## VALVE CLEARANCE

The valve clearance should be checked and adjusted, if necessary, after every 600 hours.

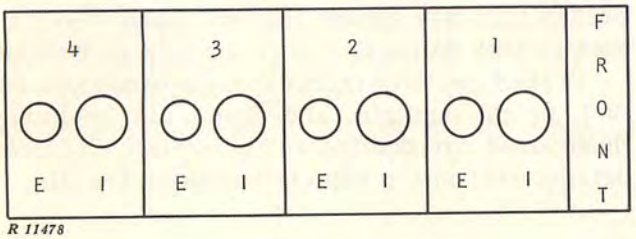
To check valve clearance (with either a hot or a cold engine), remove the hood (page 57), crankcase breather pipe, and valve rocker arm cover.



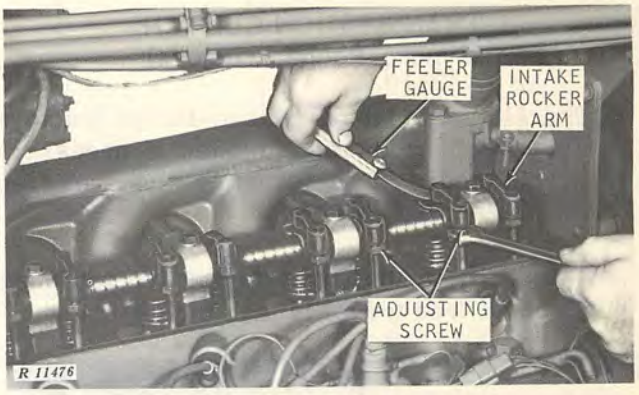

*Setting No. 1 Cylinder at Top Dead Center*

Remove the engine "top dead center" timing screw pin and the timing hole cover from the flywheel housing. Turn the engine over in the running direction (counter-clockwise when viewed from the rear of the engine) until the No. 1 (front) intake valve closes. No. 1 cylinder is now on the compression stroke. Reverse the timing screw pin and insert it into the flywheel housing hole. Continue turning the engine until the pin slides into the hole in the flywheel rim.

Use a feeler gauge to check the valve clearances. Adjust the valve clearance on No. 1 and No. 3 exhaust valves to 0.018 inch on diesel engines or 0.022 inch on gasoline engines. Adjust the valve clearance on No. 1 and No. 2 intake valves to 0.014 inch. Turn the adjusting screw up or down until clearance is correct.




*Cylinder Head Valve Sequence*




*Adjusting No. 1 Exhaust Valve Clearance*

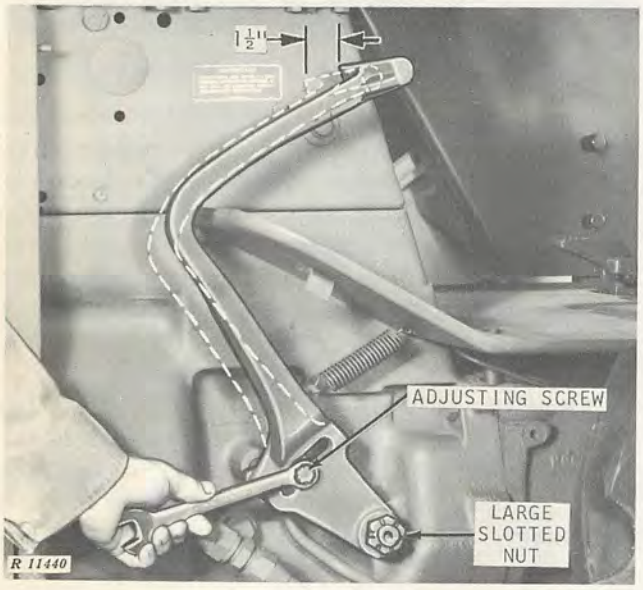
Rotate the flywheel counter-clockwise one revolution and reinsert the timing screw pin into the hole in the flywheel rim. No. 4 cylinder is now at top dead center. Adjust the valve clearance on No. 2 and No. 4 exhaust valves to 0.018 inch on diesel engines or to 0.022 inch on gasoline engines. Adjust the clearance on No. 3 and No. 4 intake valves to 0.014 inch.

After the valve clearance for all four cylinders is correct, install the timing cover and the timing screw pin, install the valve rocker arm cover, crankcase breather pipe and the hood. If necessary, replace the valve rocker arm cover gasket.

## TRANSMISSION CLUTCH (Syncro-Range Tractors)

The clutch pedal on Syncro-Range tractors should be checked and adjusted if necessary every 200 hours of operation or whenever free travel is less than 3/4-inch.

**CAUTION: Do not operate the tractor when clutch pedal free travel is less than 3/8-inch.**




*Clutch Pedal Free Travel Adjustment*

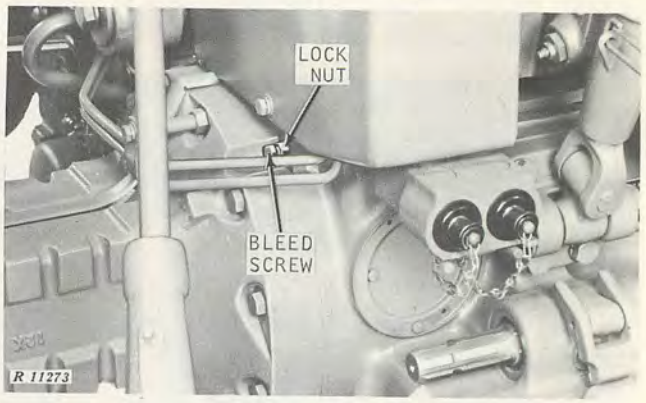
With the transmission in "PARK" and the engine running at 1900 rpm, measure the distance the clutch pedal travels before it begins to disengage the clutch. The clutch pedal free travel should be 1-1/2 inches.

If the free travel is less than 3/4 inch, tilt the battery compartment outward (when tractor has left-hand battery), remove the cotter pin, and loosen the large slotted nut. Loosen the clutch pedal adjusting screw. With the transmission in "PARK" and the engine running at 1900 rpm, adjust the pedal free travel to 1-1/2 inches. Tighten the adjusting screw and the large slotted nut. Recheck the free travel to be sure it is correct. Install a new cotter pin in the large slotted nut and close the battery compartment.

**BE CAREFUL**
**TAKE YOUR TIME—NOT YOUR LIFE**

## POWER BRAKES

The power brakes should be bled after every 200 hours of operation, or whenever brake pedal travel exceeds 5-3/4 inches on the second application after the engine is stopped.




*Brake Bleed Screw and Lock Nut*

To bleed the brakes, start the engine and loosen the bleed screw lock nuts on both sides of the tractor at the rear axle housing. Turn each bleed screw out two turns and tighten the lock nut. Tightening the lock nut prevents oil from leaking around the bleed screw.

Depress the brake pedals for 2 minutes to bleed air from the brake system. While holding the pedals down, loosen the bleed screw lock nuts and tighten the bleed screws. Tighten the lock nuts, release the pedals, and stop the engine.

Depress each pedal. Solid pedal feel should be obtained on the next application and brake pedal travel should not exceed 5-3/4 inches. If travel is excessive, repeat the bleeding procedure. If bleeding the brakes does not correct the difficulty, consult your John Deere dealer.

## TIRES

Check the tires for air inflation (page 20) every 200 hours of operation, or whenever necessary, and inspect them for possible cuts or breaks that may expose the tire fabric. To prevent further damage, repair the cuts or breaks.

Protect the tires from exposure to oil, grease, fuel, bright sunlight, and chemicals (including those used for dusting and spraying). Careless driving over sharp objects shortens tire life.

## FRONT WHEEL BEARINGS

The front wheels of your tractor are carried on roller bearings. Check the front wheels periodically for bearing end play. Clean and pack the front wheel bearings at the end of every 1200 hours of operation, or after the tractor has been operated in extremely wet and muddy conditions.

### DOUBLE FRONT WHEEL, ROLL-O-MATIC, OR WIDE FRONT AXLE

*Adjusting Bearings*

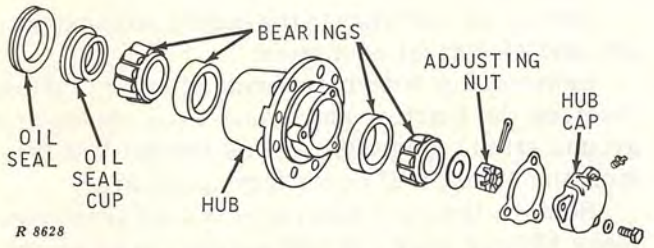
To adjust the bearings on one of these types of front ends, remove the hub cap and cotter pin. Draw the adjusting nut up until a slight drag is felt when the wheel is rotated. If the adjusting nut has to be turned three or four castellations, remove the wheel and inspect the bearings.

After the adjusting nut is drawn tight, back it off to insert the cotter pin in the first hole. If one hole is aligned with a slot when the nut is tightened, back the nut off to align the second hole with the nearest slot. Both front wheels must be adjusted in the same manner.

*Cleaning and Packing Bearings*

Disassemble and clean all parts of the hub and spindle. Inspect the bearings and replace them if they are worn. If three deep grooves are worn in the seal cup, have the oil seal and oil seal cup replaced.

Pack the bearings with wheel bearing grease. Pack the oil seal lips with SAE multipurpose-type grease. Install the wheels and adjust the front wheel bearings.

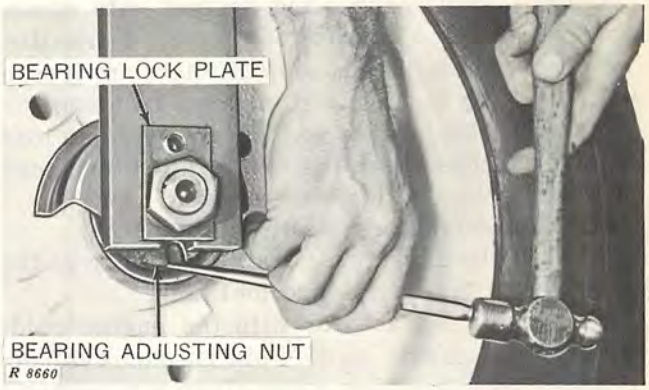



*Front Wheel Bearings (Double Front Wheel, Roll-O-Matic, or Wide Front Axle)*

### SINGLE FRONT WHEEL

*Adjusting Bearings*

Back off the bearing lock plate screw and the axle nut. Then tighten the bearing adjusting nut until a slight drag is felt when the wheel is rotated. Back the nut off and lock the adjustment in the closest notch with the lock plate screw. Tighten the axle nut. The wheel should still rotate with a slight drag. If adjustment is correct, bend corner of lock plate against axle nut.

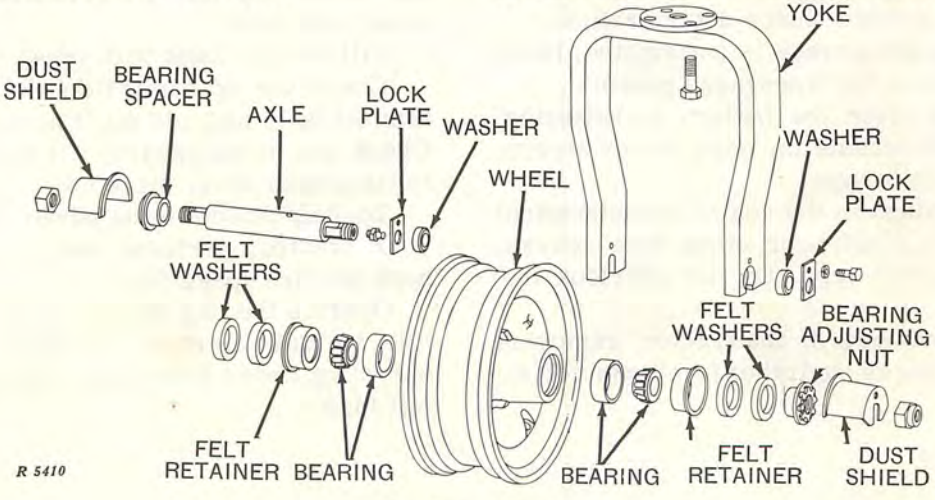



*Adjusting Single Front Wheel Bearing*

*Cleaning and Packing Bearings*

Disassemble and clean all parts of the hub and spindle. Inspect the bearings and felt washers and replace them if they are worn. Use new felt washers when installing new bearings.

Pack the bearings with wheel bearing grease. Assemble the wheel and install it on the tractor. Adjust the front wheel bearings.




*Single Front Wheel*

# TRACTOR STORAGE

If your tractor is to be put in storage for several months, the suggestions for storing it and removing it from storage on this page will help to prevent excessive deterioration.

## STORING THE TRACTOR

With the engine warm, drain the engine crankcase, replace the crankcase filter element, and fill the crankcase with new oil of the proper weight and quality (page 43). Service the air cleaner, oil cup, and oil trap. See page 53.

Drain and thoroughly flush the cooling system (page 63). Fill the cooling system with clean, soft water. Add a rust inhibitor. If freezing weather is anticipated, add sufficient antifreeze to protect the cooling system from freezing.

Operate the engine at 1500 rpm with no load until it reaches operating temperature to circulate the coolant with the thermostat open.

On diesel tractors, drain the fuel tank.

On gasoline tractors, drain all fuel from the carburetor, fuel pump, and fuel tank.

On gasoline tractors, with the engine cold, squirt some engine oil (1/8 pint) in each cylinder through the spark plug holes. Turn engine over 3 or 4 times with the starter. Replace the spark plugs and wipe off the oil.

Remove the valve rocker arm cover (page 69) and spray a thin film of polar type rust preventive (which is completely soluble in engine oil) on the valve operating mechanism, top of the cylinder head, and the underside of the rocker arm cover. Replace the cover.

Raise the tractor high enough so the tires do not touch the ground. Protect the tires from heat and sunlight to prevent undue deterioration.

When long term storage is anticipated, block the clutch pedal in the disengaged position.

Remove and clean the battery or batteries. Follow the instructions on page 68 for storing the battery or batteries.

Seal all openings in the engine and electrical equipment with plastic or other type covers, using a waterproof tape. Do not overlook the exhaust outlet.

Clean the exterior of the tractor, removing all mud, dirt, grease, and other foreign material. To prevent rust, touch up the painted surfaces where they may have been scratched or chipped.

If possible, store the tractor in a dry protected place. If it is necessary to store the tractor outside, cover it with waterproof canvas or other suitable protective material.

A good time to repair and paint your tractor is during the period between tractor working seasons. This can be done by your John Deere dealer at a nominal cost and will prove a profitable investment. A good coat of paint prevents rust, corrosion, and deterioration.

## REMOVING THE TRACTOR FROM STORAGE

Use the following procedure to remove your tractor from storage and place it in service.

Remove all protective coverings from the tractor. Check the tires to be sure they are properly inflated and then remove the blocking from the tractor.

Unseal all openings in the engine, exhaust outlet, and electrical equipment.

Remove the batteries from storage, install them on the tractor, and connect the cables and ground straps (page 66). Check the fan belt tension and adjust it if necessary (page 67).

Remove the hood and valve rocker arm cover (page 69) and pour a small quantity of engine oil of the proper weight and quality (page 43) over the valve operating mechanism. Replace the cover and hood.

Fill the fuel tank with fresh fuel.

Check the transmission and hydraulic system oil level and add oil if necessary (page 52). Check and, if necessary, fill the cooling system to its proper level (page 63).

To help maintain the power and efficiency of your tractor, perform the recommended 600-hour service (page 53).

Operate the engine for a few minutes at slow idle to make certain the tractor is in proper operating order before placing the engine under full load.


# TROUBLE SHOOTING

If the tractor shows a particular difficulty, check the symptoms listed on the following pages. Possible causes and remedies are given for each symptom. If the possible remedy does not correct the trouble, see your John Deere dealer. When not applicable to both types of engines, a symbol listed with the possible cause indicates the type of engine to which it does apply - D for a diesel engine or G for a gasoline engine.

## ENGINE HARD TO START, WILL NOT START

| *Possible Cause* | *Possible Remedy* |
|---|---|
| No fuel | Fill tank with proper fuel. Page 42. |
| Old fuel or water in tank | Drain and fill with fresh fuel. Page 42. |
| Improper type of fuel | Consult fuel supplier and use proper fuel for operating conditions. Page 42. |
| Closed fuel valve | Open the valve. Page 58. |
| Low air temperature | Use a cold-weather starting aid. Page 7. |
| Low battery output | Check electrolyte level and specific gravity of each battery. Page 65. |
| Slow starter speed | See "Starter Cranks Slowly." Page 76. |
| Water, dirt, or air in fuel system (D) | Drain, flush, fill, and bleed system. Pages 58, 59. |
| Clogged fuel filter (D) | Replace filter element and bleed system. Page 58. |
| Clogged fuel strainer | Clean sediment bowl and strainer. Page 58. |
| Dirty or faulty injectors (D) | Have your John Deere dealer check the injectors. Page 59. |
| No gasoline in carburetor (G) | Clean fuel filter and fuel lines. Check functioning of fuel pump. Open fuel shut-off valve. Page 60. |
| Dirty spark plugs (G) | Clean plugs and set gap. Page 62. |
| No spark (G) | See "Ignition System." Page 61. |
| Engine flooded (G) | Open throttle while starting to unload engine. Then repeat starting procedure. Page 6. |

## ENGINE KNOCKS

| | |
|---|---|
| Insufficient oil | Add proper oil and call your dealer. Page 43. |
| Oil picked up by air intake system | Check air cleaner for clogging or excessive oil. Page 53. |
| Low coolant temperature | See "Below Normal Engine Temperature." Page 74. |
| Ignition timed too early (G) | See "Timing Distributor." Page 62. |
| Injection pump out-of-time (D) | See your John Deere dealer. |
| Low octane fuel (G) | Change to fuel with higher octane. Page 42. |
| Engine overheating | See "Engine Overheats." Page 74. |

## ENGINE RUNS IRREGULARLY OR STALLS FREQUENTLY

| | |
|---|---|
| Low coolant temperature | See "Below Normal Engine Temperature." Page 74. |
| Low air temperature (D) | Use cold-weather starting fluid. Page 7. |
| Clogged fuel filter (D) | Replace filter element and bleed system. Page 58. |

## ENGINE RUNS IRREGULARLY OR STALLS FREQUENTLY—Continued

| *Possible Cause* | *Possible Remedy* |
|---|---|
| Clogged fuel strainer | Clean sediment bowl and strainer. Page 58. |
| Water, dirt, or air in fuel system (D) | Drain, flush, fill, and bleed system. Pages 58, 59. |
| Dirty or faulty injectors (D) | Have your John Deere dealer check the injectors. Page 59. |
| Improper carburetor setting (G) | See "Adjusting Carburetor." Page 60. |
| Improper spark plug gap (G) | Set spark plug gap. Page 62. |
| Irregular spark (G) | Dirty points. See "Distributor." Page 61. |
| Dirty spark plugs (G) | Clean plugs and set gap. Page 62. |

## LACK OF ENGINE POWER

| | |
|---|---|
| Engine overloaded | Reduce load or shift to lower gear. |
| Crankcase oil too heavy | Drain and fill crankcase with oil of proper weight and quality. Page 43. |
| Intake air restriction | Clean air cleaner. Page 53. |
| Too heavy an oil in oil-bath air cleaner | Fill oil cup with proper oil. Page 44. |
| Clogged fuel filter (D) | Replace filter element and bleed system. Page 58. |
| Clogged fuel strainer | Clean sediment bowl and strainer. Page 58. |
| Improper hitching of implement | See implement operator's manual for proper hitching. |
| Improper type of fuel | Consult fuel supplier and use proper fuel. Page 42. |
| Overheated engine | See "Engine Overheats." Page 74. |
| Vent on fuel tank obstructed | Clean fuel tank cap. Wash in distillate and blow out with air. Page 58. |
| Engine not up to temperature | See that thermostat is operating correctly. Page 63. |
| Improper valve clearance | Check clearance and adjust if necessary. Page 69. |
| Dirty or faulty injectors (D) | Have your John Deere dealer check the injectors. Page 59. |
| Injection pump out-of-time (D) | See your John Deere dealer for this service. |
| Dirty spark plugs (G) | Clean plugs and set gap. Page 62. |
| Improper ignition timing (G) | See "Timing Distributor." Page 62. |

## ENGINE OVERHEATS

| | |
|---|---|
| Temperature gauge defective | Check water with thermometer. Replace gauge if defective. |
| Chaff and trash on radiator core | Clean core by flushing out chaff. Page 65. |
| Cooling system needs flushing | Drain and flush cooling system. Page 64. |
| Defective thermostat | Remove and check thermostat. Page 64. |
| Use of low octane fuel that causes knocking (G) | Change to better fuel. Page 42. |
| Improper ignition timing (G) | See "Timing Distributor." Page 62. |
| Loose fan belt | Adjust belt tension. Page 67. |
| Faulty radiator cap | Have serviceman check radiator cap. |

## BELOW NORMAL ENGINE TEMPERATURE

| | |
|---|---|
| Defective thermostat | Remove and check thermostat. Page 63. |

## LOW ENGINE OIL PRESSURE

| *Possible Cause* | *Possible Remedy* |
|---|---|
| Low oil level | Check crankcase oil level on dipstick and add oil if necessary. Page 49. |
| Improper type of oil | Drain and fill crankcase with oil of the proper weight and quality. Page 43. |

## HIGH ENGINE OIL CONSUMPTION

| | |
|---|---|
| Crankcase oil too light | Drain and fill crankcase with oil of the proper weight and quality. Page 43. |
| Oil leaks | Check for leaks around gaskets and drain plugs. |

## HIGH FUEL CONSUMPTION

| | |
|---|---|
| Improper type of fuel | Consult your fuel supplier and use proper type of fuel for operating conditions. Page 42. |
| Engine overloaded | Reduce load or shift to lower gear. |
| Clogged or dirty air cleaner | Clean air cleaner. On oil-bath cleaners, replace oil if necessary. Page 53. |
| Improper hitching of implement | See implement operator's manual for proper hitching. |
| Improper valve clearance | Check clearance and adjust if necessary. Page 69. |
| Dirty or faulty injectors (D) | Have your John Deere dealer check the injectors. Page 59. |
| Injection pump out of time (D) | Injection pump should be timed properly. See your John Deere dealer for this service. |
| Ignition out of time (G) | Time distributor. Page 62. |
| Improper carburetor adjustment (G) | See "Adjusting Carburetor." Page 60. |
| Engine not operated at proper temperature | Check thermostat. Page 63. |

## DIESEL ENGINE EMITS BLACK OR GRAY EXHAUST SMOKE

| | |
|---|---|
| Improper type of fuel | Consult your fuel supplier and use proper type fuel for operating conditions. Page 42. |
| Engine overloaded | Reduce load or shift to a lower gear. |
| Clogged or dirty air cleaner | Check air cleaner for restrictions. On oil-bath air cleaners, be sure oil cup is filled with oil of the proper weight and quantity. Page 53. |
| Defective muffler | Check the muffler for possible damage which might create back pressure. |
| Dirty or faulty injectors | Have your John Deere dealer check the injectors. Page 59. |
| Engine out of time | Make sure injection pump is timed properly. See your John Deere dealer for this service. |

## ENGINE EMITS WHITE SMOKE

| | |
|---|---|
| Improper type of fuel | Consult fuel supplier and use proper type of fuel for operating conditions. Page 42. |
| Cold engine (D) | Warm engine up to normal operating temperature. |
| Defective thermostat (D) | Remove and check thermostat. Page 63. |
| Injection pump out-of-time (D) | Have your John Deere dealer make sure injection pump is timed properly. |

## GASOLINE ENGINE EMITS BLACK OR GRAY SMOKE

| *Possible Cause* | *Possible Remedy* |
|---|---|
| Improper carburetor adjustment | See "Adjusting Carburetor." Page 60. |
| Clogged or dirty air cleaner | Clean air cleaner. Page 53. |

## SPARK PLUG FOULING

| | |
|---|---|
| Low engine temperature | Check thermostat. Page 63. |
| Wrong heat range plug used | See your John Deere dealer for correct spark plugs. |

## BATTERIES WILL NOT CHARGE

| | |
|---|---|
| Loose or corroded connections | Clean and tighten battery connections. Page 65. |
| Sulfated or worn-out batteries | Check specific gravity and electrolyte level of each battery. Page 65. |
| Loose or defective fan belt | Adjust belt. Replace worn belt. Page 67. |

## STARTER INOPERATIVE

| | |
|---|---|
| Loose or corroded connections | Clean and tighten loose connections. Page 67. |
| Low battery output | Check specific gravity and electrolyte level of each battery. Page 65. |
| Tractor in gear (all tractors) or inching pedal not depressed (Power Shift tractors) | Place shift lever or speed selector in neutral (or PARK) or depress inching pedal (Power Shift tractors). Pages 12-14. |

## STARTER CRANKS SLOWLY

| | |
|---|---|
| Low battery output | Check specific gravity and electrolyte level of each battery. Page 65. |
| Crankcase oil too heavy | Drain and fill crankcase with oil of proper weight and quality. Page 43. |
| Loose or corroded connections | Clean and tighten loose connections. Page 65. |

## LOW OIL PRESSURE (Power Shift Transmission)

| | |
|---|---|
| Clogged transmission oil filter element (front) | Replace filter element. Page 54. |
| Clogged hydraulic oil filter element (rear) | Replace filter element. Page 54. |
| Low oil supply | Fill system with proper oil. Page 52. |

## TRANSMISSION OIL OVERHEATS (Power Shift Transmission)

| | |
|---|---|
| Low oil supply | Fill system with proper oil. Page 52. |
| Oil cooler air passages clogged | Clean oil cooler. Page 64. |
| Excessive shifting under heavy load | Reduce shifting or load. |
| Manual bypass valve open | Close valve. Page 33. |

## ENTIRE HYDRAULIC SYSTEM FAILS TO FUNCTION

| | |
|---|---|
| Low oil supply | Fill system with proper oil to mark on dipstick. Page 52. |
| Clogged filters | Replace filters. Page 54. |
| Hydraulic pump shut-off (special equipment) | Back screw out to internal stop. Page 8. |
| Possible dirt in hydraulic pump | Shut pump off and turn it on. Check filters for clogging. Page 8. |

## HYDRAULIC OIL OVERHEATS

| *Possible Cause* | *Possible Remedy* |
|---|---|
| Low oil supply | Fill system with proper oil. Page 52. |
| Oil cooler air passage clogged | Clean oil cooler. Page 64. |

## INSUFFICIENT HITCH TRANSPORT CLEARANCE

| | |
|---|---|
| Center link too long | Adjust center link. Page 28. |
| Lift links too long | Adjust lift links. Pages 29, 31. |
| Implement not level | Level implement by adjusting lift links. Page 29. |
| Implement improperly adjusted | See implement operator's manual. |

## HITCH FAILS TO LIFT

| | |
|---|---|
| Excessive load on hitch | Adjust auxiliary springs on implement or reduce load. |

## HITCH DROPS SLOWLY

| | |
|---|---|
| Speed-of-drop valve not set properly | Adjust speed-of-drop. Page 26. |

## HITCH TOO ACTIVE

| | |
|---|---|
| Selector lever in wrong position | Place selector lever in "LD" position. Page 26. |

## NO HITCH RESPONSE TO DRAFT LOAD

| | |
|---|---|
| Selector lever in wrong position or speed-of-drop too slow | Place selector lever in "LD" or "L" position or adjust speed-of-drop. Page 26. |

## REMOTE CYLINDER WILL NOT LIFT LOAD

| | |
|---|---|
| Excessive load | Adjust auxiliary springs on implement or reduce load. |
| Breakaway coupler not completely engaged | Attach hoses to coupler correctly. Page 33. |

## REMOTE CYLINDER RATE OF TRAVEL INCORRECT

| | |
|---|---|
| Incorrect flow control valve setting | Adjust rate of operation. Page 33. |

## NO REMOTE CYLINDER FLOAT POSITION

| | |
|---|---|
| Control rod in lower hole on control lever | Move control rod to upper hole on control lever. Page 33. |

## BRAKE PEDAL BOTTOMS WHEN ENGINE IS STOPPED

| | |
|---|---|
| Bleed screws left open | Bleed brakes and tighten bleed screws. Page 70. |
| Air in system | Bleed brakes. Page 70. |

## BRAKE PEDAL FEELS SPONGY

| | |
|---|---|
| Air in system | Bleed brakes. Page 70. |

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# Dependable John Deere Parts and Service

## A Bedrock Backing of Your Decision to Go with The Long Green Line

Behind every product in *John Deere's Long Green Line* stands a reliable John Deere dealer ready to serve you in time of need with dependable parts and service.

The seasons run early in his Parts Department — his well-stocked shelves of seasonal *(and Genuine)* John Deere Parts will help hold your downtime to a minimum. Service is another phase of his business that is vital to you. Working with modern equipment and guided by factory-prepared service manuals, his service specialists can pinpoint trouble with little delay; eliminate it efficiently and without costly waste effort.

You can move through your entire year's operations comfortably assured that your John Deere dealer has anticipated your needs and stands ready to help solve your problems. Your competent dealer is one more assurance of the greater satisfaction and value you'll enjoy when you invest in *The Long Green Line of John Deere Equipment.*



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