OM

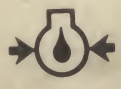
Operator's Manual

John Deere
4230
Tractor
(Serial No. 13,000-)

OM-R57253
Issue H3

To the Purchaser

This new tractor was carefully designed and manufactured to give years of dependable service. To keep it running efficiently, read the instructions in this operator's manual. Each section is clearly identified so you can easily find the information you need—whether it is operation, lubrication and periodic service, or trouble shooting. Check the Contents to learn where each section is located. Use the alphabetical index for fast reference.



Worldwide graphic symbols are used to assist identification and operation. In this manual, an identifying symbol is placed by the instructions like the example at left for the symbol on the engine oil pressure gauge. The cylinder block in the symbol represents the engine, the drop signifies oil, and the arrows indicate pressure. Regardless of the language used in a nation, this symbol means engine oil pressure without translation.

Record your tractor serial numbers in the spaces provided on page 82. Your dealer needs this information to give you prompt, efficient service and parts. If your tractor requires replacement parts, go to your John Deere dealer where you can obtain genuine John Deere parts—accept no substitutes.

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

The references in this manual to the "right-hand" and the "left-hand" sides of the tractor are determined by facing in the direction of tractor forward travel.

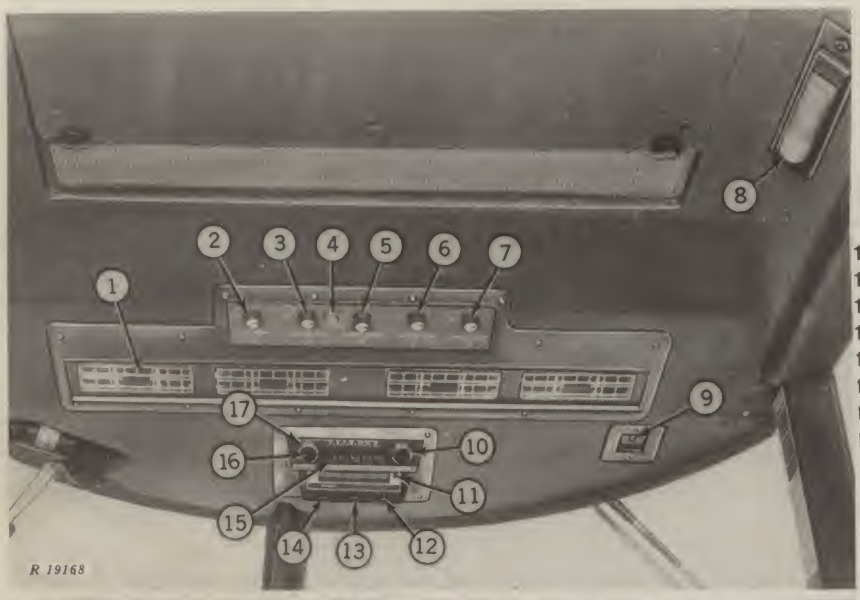
This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

Contents

John Deere 4230 Tractor

Controls and Instruments

Before attempting to operate your new tractor, become familiar with the location and purpose of its controls and instruments. Additional information will be found on page number following the control or instrument.



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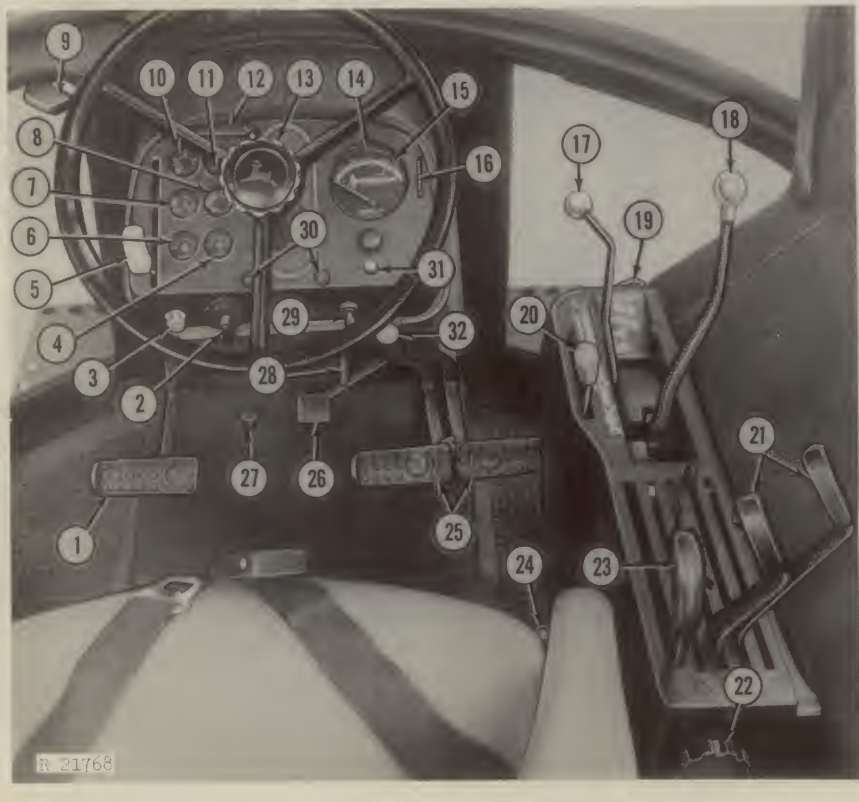

1—Clutch Pedal (page 12)
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Operation

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

PRESTARTING CHECKS

Perform the following checks and services before starting the engine for the first time each day—see pages 52 and 53 for additional information.

(a) Check the engine crankcase oil level.
(b) Check the radiator coolant level.
(c) Drain contaminants from fuel filter.

(d) Lubricate the wide swing drawbar rollers, the front axle pivot pins, steering knuckle pins, and tie rod ends.

(e) Grease the front wheel bearings and rear axle bearings if the tractor has been operated in extremely wet or muddy conditions.

(f) Make sure the fuel shut-off valve on the fuel tank is open.

OPERATING THE ENGINE

STARTING THE DIESEL ENGINE

NOTE: If the prevailing temperature is 40°F. or lower, it may be necessary to use a cold weather starting aid to start the engine (page 4).

Perform the Prestarting checks listed above.

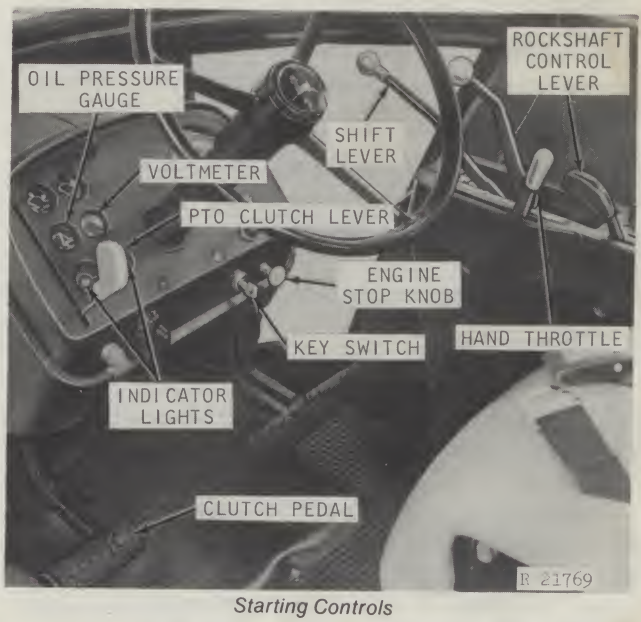
The gauge pointers for the fuel gauge, engine water temperature gauge and engine oil pressure gauge will be in approximately the same position they were in when the key switch was turned off.

(1) See that the transmission is in PARK (see worldwide symbol at left), the PTO clutch is disengaged, the rockshaft control lever is in lowered position and the remote cylinder operating levers in neutral. Depress the clutch pedal or inching pedal.

Before the starter will operate, the Syncro-Range shift lever or the Power Shift speed selector must be in PARK or neutral. The Quad-Range transmission speed selector must be in neutral.

(2) Place the hand throttle in the 1200 rpm position (approximately 1/3 of its travel forward).

(3) Turn the key switch clockwise to the first position.



Starting Controls

The voltmeter (see symbol) hand should rise to the green band for battery condition. If it does not, the battery voltage is low and the engine may be difficult to start. See "Trouble Shooting" for possible causes of low voltage.

If the tractor has a Perma-Clutch, the transmission oil indicator lamp should glow. If it does not glow, turn off key switch and determine the cause.

(4) Turn the key switch all the way to the right to start the engine.

When the key switch is in the start position, the air cleaner indicator lamp should glow. If the tractor has a power shift transmission, the transmission oil indicator lamp should also glow. If a light fails to glow, turn off the key switch and determine the cause.

Do not operate the starter for more than 30 seconds at a time. To do so may overheat the starter. If the engine does not start the first time, wait a minute or two before trying again. If it does not start after four attempts, see "Trouble Shooting."

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

(5) After the engine starts, release the key switch. The engine oil pressure gauge pointer should rise above the warning zone to indicate satisfactory oil pressure. The indicator lamps should go out. The voltmeter pointer should rise into the green band for charging. If an indicator lamp or gauge indicates some difficulty, stop the engine and determine the cause.

Always leave key switch in the "ON" position while the engine is running, so the instruments and indicator lights will function.

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

COLD WEATHER STARTING AIDS

For cold weather starting, the tractor may be equipped with either an electrically or manually operated ether starting fluid adapter. Other starting aids are available from your John Deere dealer.

These aids are effective 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 Adapters

These adapters are used to inject atomized starting fluid into the engine air intake system. Pressurized cans of starting fluid are available from your John Deere dealer.

CAUTION: Ether starting fluid is highly flammable. Do not use near fire, sparks, or flames. Read the cautionary information on the container.

Store starting fluid in a cool, dry, and protected area to prevent accidental discharge. Keep the starting fluid away from extreme heat or cold.

Manually Operated

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

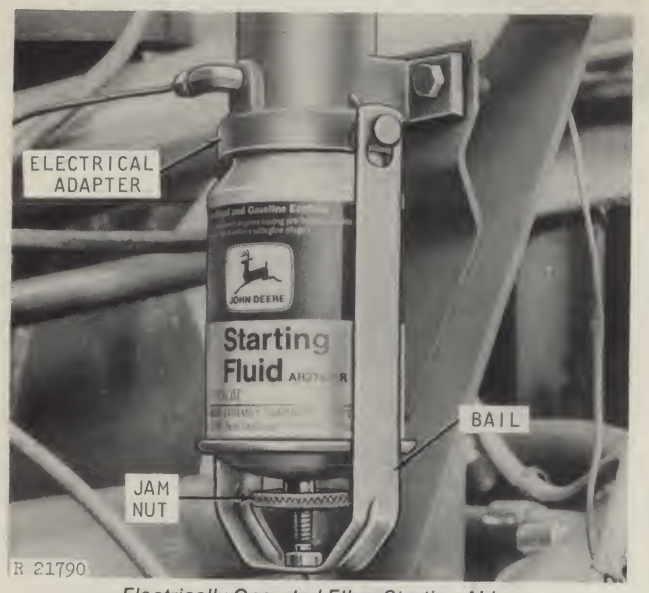
IMPORTANT: To avoid damage, turn engine with starter one or two revolutions before injecting starting fluid. Inject starting fluid only while the engine is turning.

Injecting Starting Fluid

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 to avoid accidental discharge.

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.

Electrically Operated



Electrically Operated Ether Starting Aid

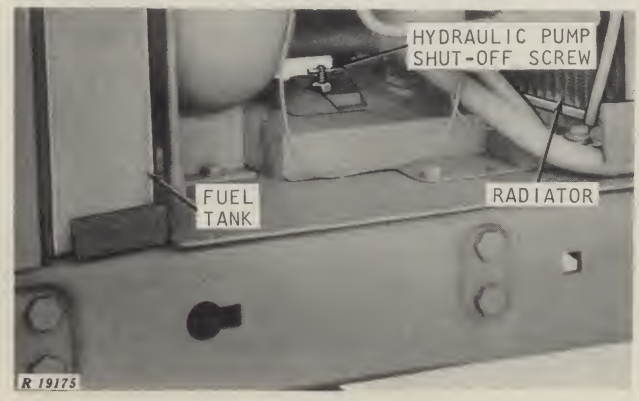
To install the can of starting fluid, remove the safety cap and plastic spray button from the can. Loosen the jam nut on the bail sufficiently to permit installation of the can into adapter as shown in the illustration above. Tighten the jam nut securely to hold the can in position. To prevent dust from being drawn into the engine, always leave a can in place on the adapter.

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

To inject starting fluid, momentarily depress the ether starting aid button on dash (page 2), using short "bursts" while cranking the engine at the same time.

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.

Hydraulic Pump Shut-Off



Hydraulic Pump Shut-Off Screw

If the tractor has a hydraulic pump shut-off screw, the starter speed may be increased during cold weather by shutting off the hydraulic pump so it will not build up pressure. This will also prevent inadvertent operation of the Power Front Wheel Drive.

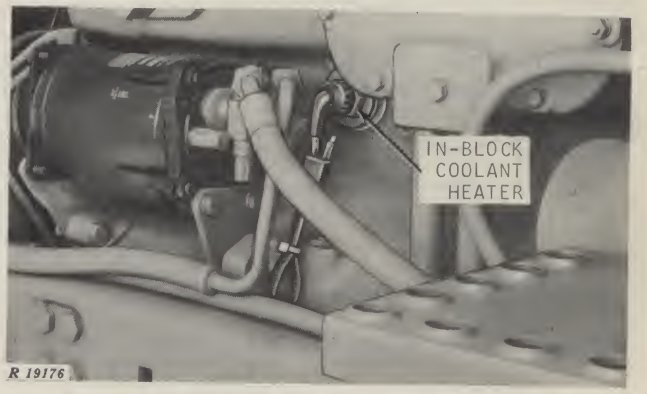
After turning the shut-off screw in (clockwise) one turn, turn the screw in further until resistance is felt. Then turn the screw in one more turn.

⚠ **CAUTION: On Power Front-Wheel Drive tractors, stop engine before backing out shut-off screw.**

After the engine has started, back the shut-off screw all the way out (turn it counterclockwise). The pump will now build up pressure.

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

Electric Coolant Heaters



Electric In-Block Coolant Heater

To facilitate cold weather starting, a 115-volt electrical in-block coolant heater is available from your John Deere dealer.

The in-block coolant heater is a 1000-watt unit that is on the left-hand side of the engine. The use of this heater will reduce drag on the engine to improve starting.

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

Under normal conditions, up to 5 hours may be required at temperatures between 0°F. and 20°F. or up to 8 hours for temperatures below 0°F.

Additional Battery

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

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

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 battery.

Connect a jumper cable of 000 size to the positive (+) post of a 12-volt booster battery and to the POSITIVE (+) post of the left-hand tractor battery that is connected to the starter. Connect one end of the other jumper cable to the negative post of the booster battery and to a good ground on the tractor frame away from the battery. Never connect jumper cables to pipes or thin sheet metal.

IMPORTANT: Reversed polarity booster battery connections will damage the alternator or electrical wiring.

See your John Deere dealer for additional booster battery information.

TRACTOR WARM-UP PERIOD

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

A good way to do this is first to idle the engine at about 1200 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 2200 rpm. The engine can be operated at any speed in the working range to meet various operating conditions. Operate the engine at 2200 rpm to obtain the ASAE Standard PTO speeds.

Normal slow idle speed is approximately 800 rpm.

The engine speed of 2200 rpm is the speed when under full load. At light or no load condition the speed may rise to approximately 2400 rpm. See page 56 for no load engine speeds.

Hand Throttle

Hand Throttle

Use the hand throttle to select slow idle or any of the variable governed speeds from 1500 to 2200 rpm.

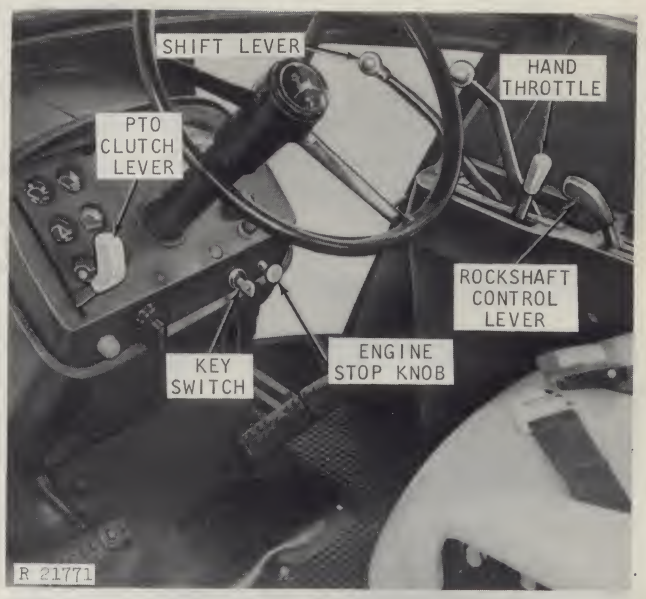
Pull the throttle rearward to obtain the slow idle speed of 800 rpm.

Push the throttle all the way forward to obtain the 2200 rpm load speed position.

STOPPING THE ENGINE

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.

After idling the engine for a few minutes, pull the engine stop knob all the way out. After the engine stops, push the engine stop knob in and turn the key switch off.



Stopping Controls

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

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

BREAKING IN THE ENGINE

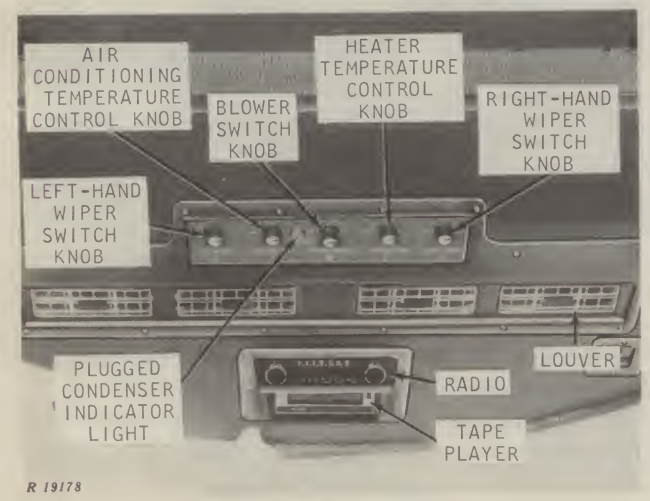
If the coolant temperature rises to the warning zone on the gauge, shift to a lower gear to reduce the load on the engine. Be sure to follow the special break-in lubrication instructions given on page 47.

The engine is ready for normal operation. However, to facilitate break-in, avoid prolonged periods of engine idling for the first 100 hours of service.

OPERATING THE TRACTOR

CAUTION: The air filters are not designed to filter out harmful chemicals. When using agricultural chemicals, follow the instructions given in the implement operator's manual and those given by the chemical manufacturer.

SOUND-GARD BODY CONTROLS



Sound-Gard Body Controls

Blower Switch

To maintain a clean atmosphere within the Sound-Gard Body when operating the tractor, run the blower continuously with the doors and windows closed. To obtain low fan speed, turn the blower switch knob clockwise to the first position. For high fan speed, turn the switch clockwise as far as it will go. Turn the switch counterclockwise to shut off the fan.

Adjust the louvers to control the direction of air flow forward or rearward and to the right or left.

Heater Temperature Control Knob

The Sound-Gard Body may have a heater that is connected to the tractor engine cooling system. Coolant flow through the heater core is controlled by the heater temperature control knob. Adjust the volume of air flow with the blower switch.

To obtain maximum heat, turn the heater control knob all the way clockwise. Turn the knob counterclockwise to reduce the temperature. Turning the knob all the way counterclockwise shuts the heater off.

Air Conditioning Temperature Control Knob

On Sound-Gard Body with air conditioning, the air conditioning temperature control knob turns the air conditioning system on and controls the cooling temperature in the Sound-Gard Body. For maximum cooling, turn the knob all the way clockwise. For less cooling, turn the knob counterclockwise.

The blower switch must be turned on before the air conditioning system will operate.

Turning the heater on when operating the air conditioner will help control humidity. However, under normal conditions the heater temperature knob should be turned off when operating the air conditioner.

Plugged Condenser Indicator Light

When this indicator lamp glows, the condenser core or side grille screen is plugged and needs cleaning. Stop the tractor, release the left-hand side grille screen and clean the condenser core and side grille screen. See page 66.

Wiper Switches

The left-hand and right-hand windshield wipers have separate switches. To obtain low wiper speed, turn the knob clockwise to the first position. For fast wiper speed, turn the knob all the way clockwise. The wiper blade returns to a park position when the switch is turned counterclockwise to the off position.

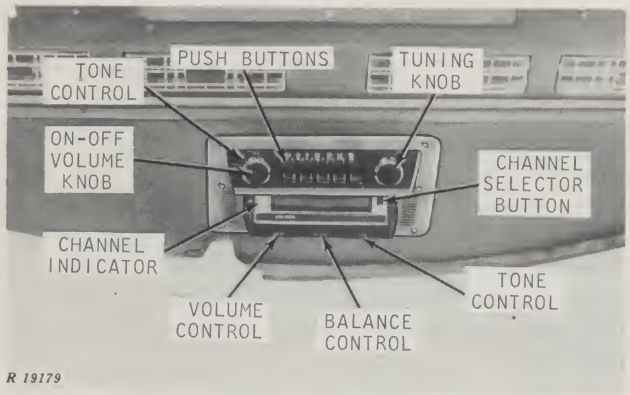
Radio

The radio tuning knob is at the right side of the radio dial. A combination on-off and volume control knob is at the left of the dial. A ring-type tone control is located behind the volume control knob.

To adjust the push buttons, pull the selector button straight out until it stops. Tune in the desired station. Then push the selector button straight in until it stops. Then release it.

Tape Player

To operate the tape player, insert an eight track tape cartridge label side up and open end first, into



Radio and Tape Player

the tape slot. Push the cartridge into the tape slot until it is firmly seated. This automatically turns the tape player on. If the radio was turned on, a relay will disconnect the radio to prevent radio operation while the tape is playing.

To stop the player, remove the tape cartridge.

Protect the open end of the tape cartridge from damage and dirt. It is recommended that a tape storage box be used to prevent dust accumulation on the tape.

The tape player will play all four channels automatically and in order. An indicator light at the left of the tape slot indicates which channel is playing. If a different channel is desired, push the channel selector button at the right of the tape slot. The unit will step to the next channel each time the button is pushed.

The tape player volume, balance and tone controls are at the bottom front edge of the tape player.

Moving the stereo balance control to the left decreases the volume of the left-hand speaker and increases the volume of the right-hand speaker, while moving the control to the right does just the opposite. Adjust the stereo balance control until you hear equal volume from both speakers.

Windows

When operating the tractor with the windows open, be careful to prevent damage to windows from rear-mounted implements, other mounted equipment, or from driving too close to some object.

SEAT

The deluxe tractor seat has a steel compression spring and shock absorber to provide "float ride" suspension. The seat is also equipped with a flexibly

SEAT

Seat Controls

mounted padded backrest and semicircular foam padding which surrounds the operator.

Use only warm water and mild soap to clean the seat cushions. Never use stronger 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 Weight Of Operator

The tension of the steel compression spring can be adjusted to conform to your weight. This enables the seat to "float" when you are traveling over rough ground. To make this adjustment, turn the weight adjusting screw clockwise to increase tension if the seat hits bottom or counterclockwise to decrease spring tension if the suspension seems too hard.

Adjusting Seat On Low Profile Tractor

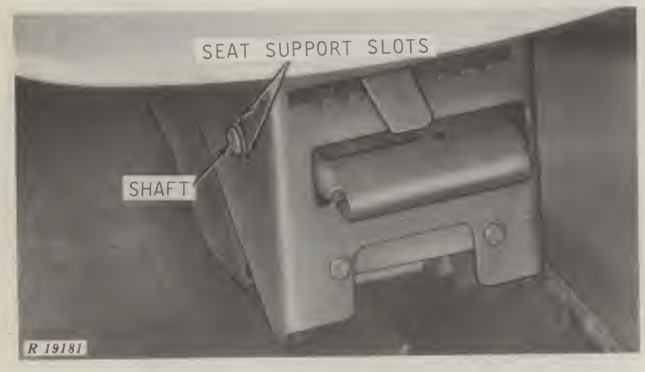
To move the seat to the upper rear position, pull up on the release latch while sitting on the seat. Then stand up and move the seat upward and rearward.

To adjust the seat for weight of the operator, loosen the wing nuts at the lower shock absorber mounting. Slide the mounting forward or rearward as necessary and tighten the wing nut.

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.

Adjusting Counterbalance Spring



Counterbalance Shaft

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

ROLL-GARD AND SEAT BELT

A protective four-post Roll-Gard is incorporated in each Sound-Gard Body. Your tractor may be equipped with a separate four-post Roll-Gard. Otherwise, a protective two-post Roll-Gard with seat belt is available for your tractor. See page 73 for more information.

CAUTION: Under almost all operating conditions:

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

GROUND SPEEDS

A tractor with a Syncro-Range transmission has 8 forward and 2 reverse speeds, while those with a Creeper transmission have 13 forward and 4 reverse speeds. With a Power Shift transmission 8 forward and 4 reverse speeds are available. A Quad-Range transmission has 16 forward and 6 reverse speeds. The gear selected and the throttle setting enable the operator to balance speed and power for maximum economy and allow flexibility to meet varying working conditions.

Examples of the ground speeds at which a tractor with 18.4-34 rear tires will travel at engine speeds of 1500 and 2200 rpm are shown below. If equipped with 15.5-38 tires, ground speed will be 2.7% slower; with 16.9-34 tires, 4.4% slower; 16.9-38 tires, 3% faster; 23.1-30 tires, 0.7% faster; 23.1-26 tires, 3% slower. Hi-Crop tractors are 7.7% faster.

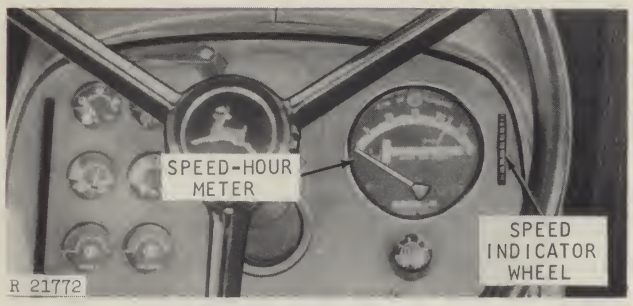
SYNCRO-RANGE, CREEPER, AND POWER SHIFT TRANSMISSION GROUND SPEEDS

Gear	Syncro-Range*		Power Shift	
	1500 rpm	2200 rpm	1500 rpm	2200 rpm
1st	(.3) 1.3	(.4) 1.9	1.1	1.7
2nd	(.4) 2.1	(.6) 3.0	1.6	2.4
3rd	(.6) 2.7	(.8) 4.0	2.5	3.7
4th	(.7) 3.5	(1.1) 5.1	3.2	4.7
5th	(.9) 4.3	(1.3) 6.4	4.2	6.1
6th	5.7	8.3	5.4	7.9
7th	7.4	10.8	7.1	10.5
8th	12.0	17.6	11.9	17.5
1st reverse	(.6) 2.6	(.8) 3.9	1.3	1.9
2nd reverse	(.9) 4.2	(1.3) 6.2	1.9	2.8
3rd reverse	....	....	2.9	4.3
4th reverse	....	....	3.8	5.5

QUAD-RANGE TRANSMISSION GROUND SPEEDS

Range	Speed	Forward		Reverse	
		1500 rpm	2200 rpm	1500 rpm	2200 rpm
A	1	1.3	1.9	2.1	3.0
	2	1.6	2.4	2.6	3.9
	3	2.1	3.1	---	---
	4	2.7	4.0	---	---
B	1	3.0	4.4	4.8	7.0
	2	3.8	5.6	6.1	8.9
	3	4.9	7.2	---	---
	4	6.3	9.2	---	---
C	1	3.5	5.2	5.7	8.3
	2	4.5	6.6	7.2	10.5
	3	5.8	8.6	---	---
	4	7.4	10.9	---	---
D	1	5.4	8.0	---	---
	2	6.9	10.1	---	---
	3	9.0	13.1	---	---
	4	11.4	16.7	---	---

** Tractors with Creeper transmission have same speeds as Syncro-Range transmission when Creeper control lever is in direct drive (1:1) position. When lever is in reduction drive, speeds are as shown in parentheses.*

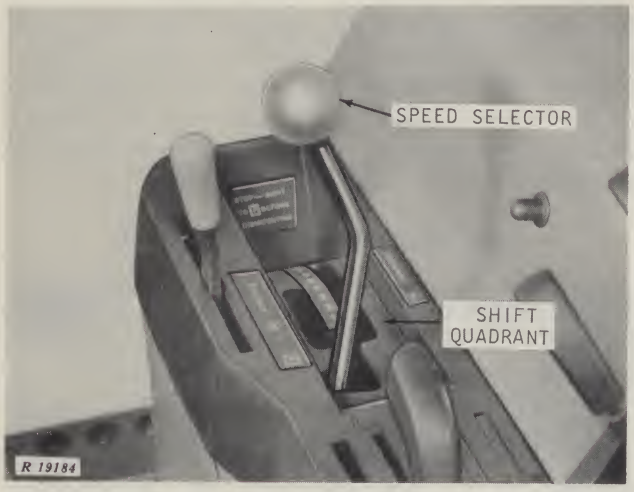


Speed Indicator Wheel

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

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

POWER SHIFT TRANSMISSION



Speed Selector

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.

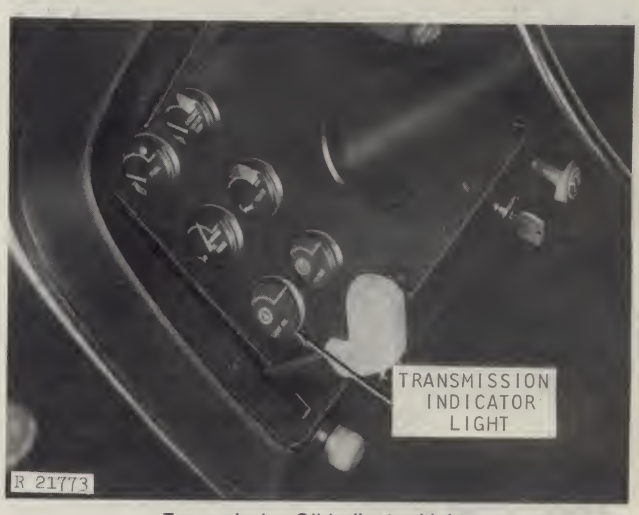
To move the tractor forward, move the speed selector from neutral to the desired gear in the right-hand or forward side of the quadrant. Progressive shifting (one gear at a time) will result in smoother speed change.

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 Oil Indicator Light

When operating a tractor with the Power Shift transmission, check the transmission oil indicator light for overheating of transmission oil. After glowing for a minute, the light will start flashing.

Should the transmission oil indicator light glow, stop the tractor and clean all dirt and trash from the grille screens and the transmission-hydraulic oil cooler core. See page 63. Also check for proper transmission hydraulic oil level. If necessary, fill the system to the proper level. See page 54. A clogged filter can also cause overheating. If this does not correct the difficulty, call your John Deere dealer. Do not continue tractor operation when the indicator light is glowing.

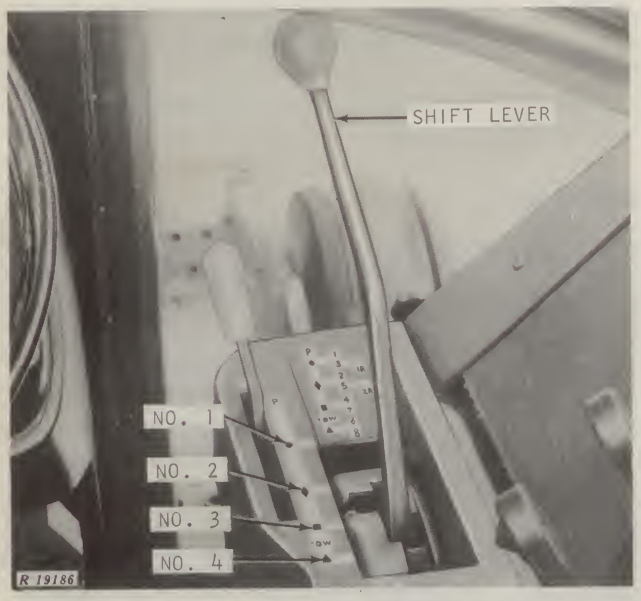
See your John Deere dealer whenever the transmission in your tractor first shows signs of not operating satisfactorily.

IMPORTANT: Never attempt to start Power Shift tractor by towing or pushing.

SYNCRO-RANGE TRANSMISSION

Shifting Between Stations

The shift quadrant has four shift stations. Stations No. 1 (circle) and 2 (diamond) have two forward speeds and one reverse speed. Stations No. 3 (square) and 4 (triangle) have two forward speeds only.



Syncro-Range Transmission Shift Quadrant with Shift Lever in 5th Gear

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, 2nd and 5th gears, 4th and 7th gears, and 6th and 8th gears without stopping the tractor.

When shifting from a forward speed to a reverse speed, stop the tractor before shifting to avoid damage to the tractor.

Gradually release the clutch pedal to engage the clutch.

Operation

NOTE: To prevent unnecessary wear or clutch damage, never "ride" the clutch pedal by resting your foot on the pedal.

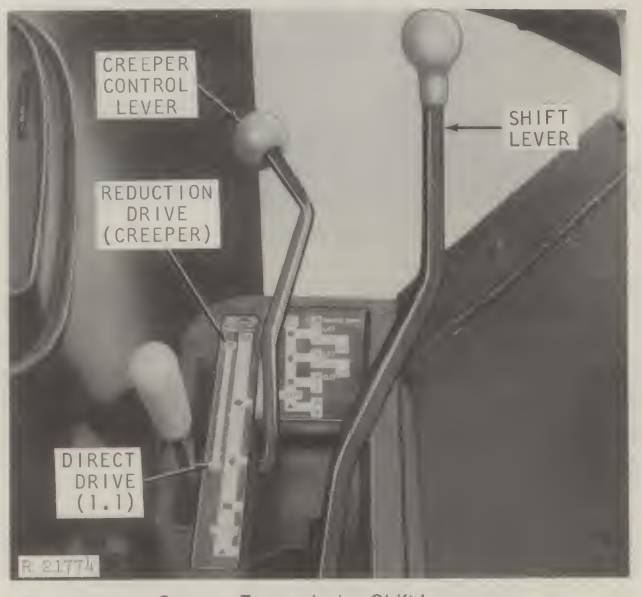
The transmission oil indicator light will glow when transmission oil pressure is low.

If the transmission oil indicator light glows, stop the tractor and check for proper transmission hydraulic system oil level. If the level is correct, change the transmission hydraulic system oil filter element. At engine speeds above 1500 rpm, the transmission oil indicator light should not glow. However, at engine speeds below 1500 rpm, the light may flicker on briefly when releasing the clutch pedal. The length of time the light remains on is an indication of filter condition or transmission hydraulic system oil level. If the light remains on for more than 3 seconds, with the tractor at operating temperature and the transmission hydraulic system oil at the proper level, change the filter at the next refueling and servicing.

If the tractor is equipped with an optional transmission oil temperature switch, the light will also indicate high transmission oil temperature that is caused by clogged side grille screens or oil cooler core.

NOTE: In cold weather, after starting a cold engine, hold the clutch pedal down for 10 to 15 seconds with an engine speed of 1500 rpm or more before shifting. Then move the shift lever to the desired station and hold a steady pressure forward or rearward on the lever until it moves into the desired gear. Do not apply excessive force to the shift lever.

CREEPER TRANSMISSION



Creeper Transmission Shift Levers

The optional Creeper transmission consists of a collar-shifted planetary unit working in conjuction with the regular Syncro-Range transmission to provide eight forward speeds and two reverse speeds in direct drive (1:1), and five forward speeds plus two reverse speeds in reduction drive (Creeper).

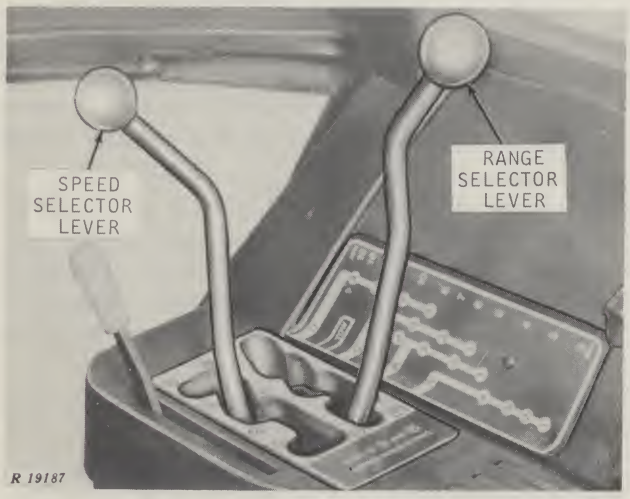
To shift from direct drive to reduction drive (or reduction drive to direct drive) with the tractor stopped and the clutch pedal depressed, move the Creeper control lever to the desired position. Then move the range selector lever to the station that has the desired speed. Refer to instructions given in left-hand column on page 12 when shifting between and within stations with the Creeper control lever in direct drive. A mechanical interlock prevents shifting into 6th, 7th, and 8th speeds when the control lever is in reduction drive.

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

QUAD-RANGE TRANSMISSION

Shifting with Range Selector Lever

The shift quadrant has four shift stations. Stations "A", "B" and "C" have four forward speeds and two reverse speeds. Station "D" has four forward speeds only.



Quad-Range Transmission Selector Levers

Using the chart by the selector lever, select a station having speeds so that most of the shifting with the speed selector lever will use the "on the go" power shifting available between 1 and 2 or between 3 and 4.

With the tractor stopped and the clutch pedal depressed, move the range selector lever to the station that has the desired speed shown on the chart.

Shifting with Speed Selector Lever

Moving the speed selector lever sideways shifts the two-speed power shift planetary transmission between 1 and 2, 3 and 4, or 1R and 2R. The speed selector lever may be moved sideways without using clutch pedal, to shift "on the go" or when the tractor is stopped.

Moving the lever forward or rearward of neutral "N" shifts the eight-speed syncro-range transmission. Shifting the lever rearward permits engagement of the 1-2 forward speed station or the 1R-2R reverse speed station. Moving the lever forward shifts the transmission into the 3-4 forward speed station. With the clutch pedal depressed, the speed selector may be shifted forward or rearward into a forward speed station while the tractor is in motion.

When moving the speed selector lever from a forward speed to a reverse speed, stop the tractor before shifting into the 1R-2R station.

When operating a tractor with a Quad-Range transmission, check the transmission oil indicator light for satisfactory transmission operation. See illustration, page 11.

Gradually release the clutch pedal to engage the clutch.

Operation

NOTE: To prevent unnecessary wear or clutch damage, never "ride" the clutch pedal by resting your foot on the pedal.

If the transmission oil indicator light glows, stop the tractor and check for proper transmission-hydraulic system oil level. If the level is correct, change the transmission-hydraulic system oil filter element. At engine speeds above 1500 rpm, the transmission oil indicator light should not glow. However, at engine speeds below 1500 rpm, the transmission oil indicator light may flicker on briefly when releasing the clutch pedal or when making a power shift with the speed selector. The length of time the light remains on is an indication of filter condition or transmission oil level. If the light remains on for as much as 3 seconds with the tractor at operating temperature, at speeds below 1500 rpm, and with the transmission oil at the proper level, change the filter at the next refueling and servicing. Clean the oil cooler and side grille screens if they are clogged.

NOTE: In cold weather, after starting a cold engine, hold the clutch pedal down for 10 to 15 seconds with an engine speed of 1500 rpm or more before shifting. Then move the range selector to the desired range. After shifting into a range, hold a steady pressure forward or rearward on the speed selector until the lever moves into the desired speed. Do not apply excessive force to the shift lever.

PARKING THE TRACTOR

IMPORTANT: Be sure the tractor is stopped before placing the transmission in park.

Power Shift Tractors

On Power Shift tractors, move the speed selector rearward and to the left into park position. Shifting from park to neutral usually releases the park locking action. If the tractor is parked on a steep incline, it may be necessary to move the speed selector to the first speed forward or reverse to move the tractor up the incline.

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 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.

Creeper Transmission Tractors

Move the selector lever to direct drive position (1:1) and move shift lever to PARK. Then follow instructions given above for Syncro-Range tranctors.

Quad-Range Tractors

On Quad-Range tractors, move the speed selector lever to neutral "N". Then pull the range selector lever all the way rearward into PARK.

To shift from PARK when the tractor is not parked on a steep incline, first depress the clutch pedal and move the range selector lever forward 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 push the range selector lever forward against spring pressure into "A" shift station. Then move the speed selector lever 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.

⚠ CAUTION: Whenever the tractor is stopped, place the transmission in PARK BEFORE DISMOUNTING. Never dismount from the tractor when it is in motion.

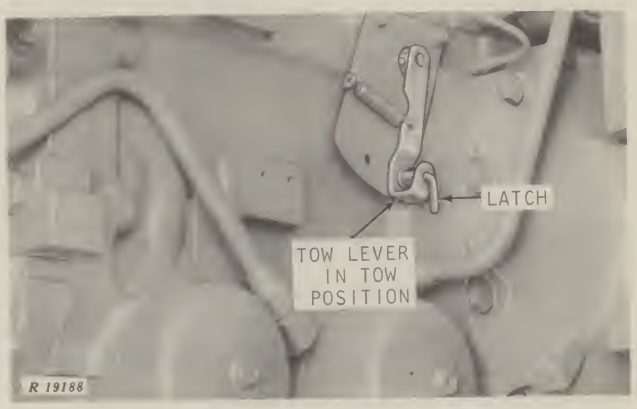
TOWING THE TRACTOR

⚠ CAUTION: Never tow the tractor at high speeds. Tow tractor with the engine running to maintain power operation of steering and brakes.

When towing the tractor, the transmission-hydraulic system should be at the full mark. If the front end is raised, add one gallon of oil for each six inches the front end is raised. Be sure differential lock is disengaged.

IMPORTANT: To prevent transmission damage, always place the tow lever or shift lever in "TOW" position. Do not attach towing means to front wheel knuckles or steering mechanism.

Power Shift Tractors



Tow Lever on Power Shift Tractor

When towing a Power Shift tractor, pull out on the tow lever latch and move the lever rearward until the latch holds the lever in "TOW" position. Place the speed selector in neutral "N" to move the tractor.

To operate the tractor after towing, place the speed selector in PARK. Pull out on the tow lever latch and allow the spring to move the lever forward. If the lever does not latch in the forward position, attempt to move the tractor slowly and the spring will move the lever forward.

The engine can not be started by towing the tractor.

Syncro-Range and Creeper Transmission Tractors

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

The engine can not be started by towing the tractor.

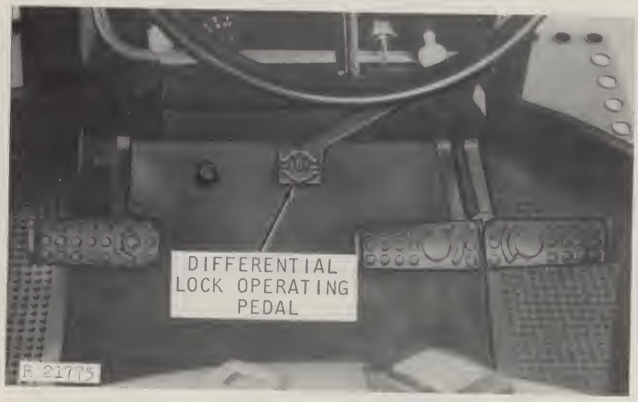
Quad-Range Tractors

The shift quadrant for Quad-Range Transmission has a "TOW" position. Whenever the tractor is to be

towed, move the speed selector lever to neutral "N" and the range selector lever to the "TOW" position.

The engine can not be started by towing the tractor.

DIFFERENTIAL LOCK



Differential Lock Operating Pedal

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.

When one wheel starts to slip or whenever desired, engage the differential lock by depressing the operating pedal located between the clutch and brake pedals. 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 or engaging the differential lock.

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

POWER FRONT-WHEEL DRIVE

Power Front-Wheel Drive Operating Switch

The Power Front-Wheel Drive has a fixed displacement, axial piston hydraulic motor and a planetary transmission in each front wheel. The tractor main hydraulic pump furnishes hydraulic power for the front wheels.

Use the Power Front-Wheel Drive in poor traction conditions or when needed to improve steering control. The drive can be engaged "on the go" or when the tractor is stopped by depressing the upper portion of the drive operating switch rocker to the high torque position (maximum pulling power).

When less power is required, depress the lower portion of the switch rocker for low torque position.

Always move the switch rocker to the center "off" position when the drive is not needed. Do not engage the drive when hitching to drawn equipment. Do not attempt to operate the tractor with the front-wheel drive only.

Whenever the inching pedal or the clutch pèdal is depressed, a switch disconnects the drive.

When the operating switch rocker is depressed, the drive is automatically engaged or disengaged as necessary to synchronize the front drive when the shift lever is moved to the various transmission speeds as shown in the following chart.

Transmission	Low Torque		High Torque	
	Forward speeds	Reverse speeds	Forward speeds	Reverse speeds
Syncro-range	1,2,3,4,5,6	1,2	1,2,3,4	1,2
Power Shift	1,2,3,4,5,6	1,2,3,4	1,2,3,4	1,2,3,4
Quad-Range	A-1,2,3,4 B-1,2,3 C-1,2,3	A-1R,2R B-1R C-1R	A-1,2,3,4 B-1,2*,3* C-1*,2*,3*	A-1R,2R B-1R* C-1R*

* *Automatically switched into low torque drive.*

When a front wheel slips and a "differential lock" action is needed, depress the lower portion of the switch rocker to the low torque position. This connects the hydraulic motors in series.

CAUTION: Always place transmission in park, lower implements to the ground, and shut off the engine before dismounting. Always start the engine from the operator's seat. Shutting off the hydraulic pump as instructed on page 5 will prevent accidental tractor movement by the front wheels.

POWER STEERING

Tilt-Telescope Steering Wheel

The tractor is equipped with full hydraulic power steering and may be equipped with a Tilt-Telescope steering wheel.

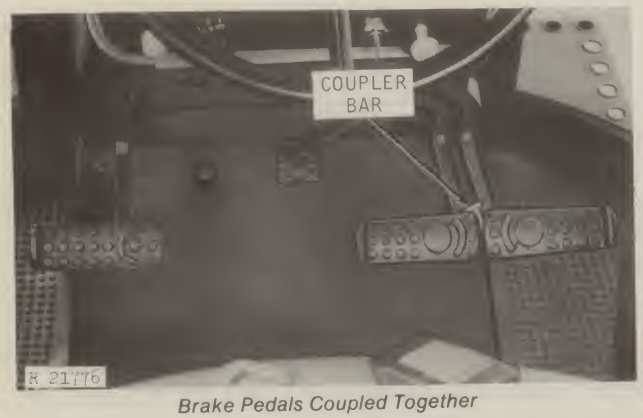
To adjust the tilt of the steering wheel, pull upward on the tilt release lever and move the wheel to the new position. Release the lever and move the steering wheel slightly until the lever locks into position.

To move the steering wheel in or out on the shaft, loosen the hub at the center of the steering wheel by turning it counterclockwise. Move the steering wheel to the new position and tighten the hub.

POWER BRAKES

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

The brake accumulator provides oil to the brakes for several brake applications after the tractor engine is stopped.



Brake Pedals Coupled Together

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.

NOTE: To prevent unnecessary wear or excessive fuel consumption, never "ride" the brake pedals by resting the foot on the pedals.

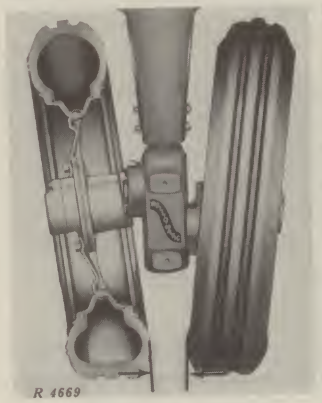
TOWED LOADS

⚠ CAUTION: Towed loads that weigh more than twice the weight of the tractor should have brakes. If not, reduce speed and avoid inclines.

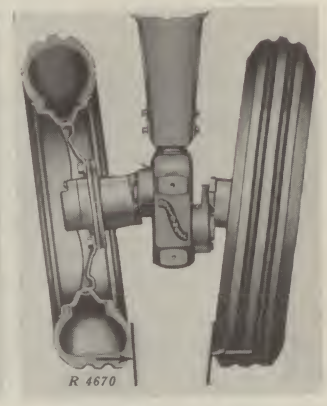
FRONT AXLES

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



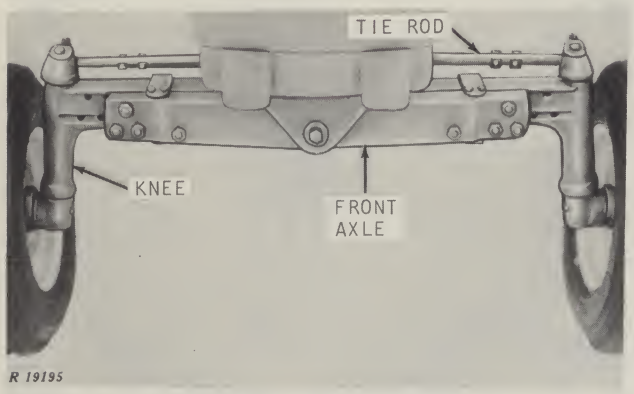
Double Front Wheels at Wide Spacing

For ease in steering and clearance for front-mounted implements, dish the wheels inward for narrow spacing. 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 tighten bolts to 100 ft-lbs torque.

Adjustable-Tread Front Axle

The adjustable tread front axle is adjustable in 4-inch steps.



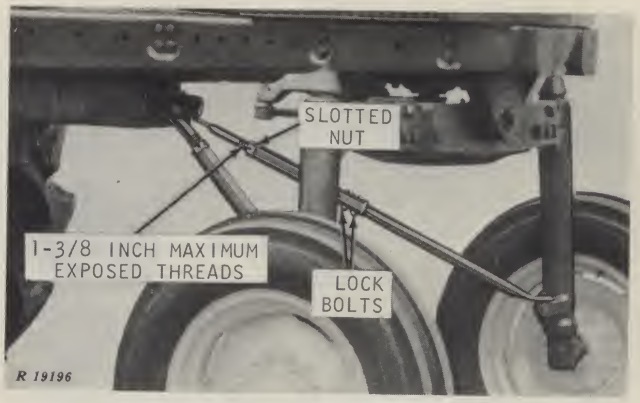
Front Wheel Tread Adjustment

The chart below lists the available tread ranges. Reverse the wheel "dish" in the same manner as for double front wheels.

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

IMPORTANT: Do not place jack under engine oil pan or, on Power Front-Wheel Drive tractor, under the hose guard at the front axle.

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



Hi-Crop Radius Rods

Remove the bolts from the front axle and from the tie rods. Move the front axle knees in or out to give the desired tread width. Install the bolts in the front axle and tighten them to 320 ft-lbs torque (regular axle), 370 ft-lbs torque (narrow and wide axles), and 445 ft-lbs torque (Hi-Crop). Install bolts in the tie rods. Check toe-in.

If equipped with a Power Front-Wheel Drive, the tractor's power steering motor may be used to move the wheel assembly by resetting the tie rod length and using the full steering arm travel. After adjusting the tread, be sure the small bleed hose is free and not kinked or pinched so as to prevent oil flow.

On Hi-Crop tractors, adjust the radius rod 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.

TIRE	NARROW TREAD AXLE		REGULAR TREAD AXLE		WIDE TREAD AXLE	
	DISHED IN	DISHED OUT	DISHED IN	DISHED OUT	DISHED IN	DISHED OUT
6.00-16	48" - 68-1/8"	57-3/4" - 77-7/8"	52" - 76-1/8"	61-3/4" - 85-7/8"	58" - 86-1/8"	67-3/4" - 95-7/8"
7.5L-15 7.50-16 7.50-18	50-1/8" - 70-1/4"	55-3/8" - 75-1/2"	54-1/8" - 78-1/4"	59-3/8" - 83-1/2"	60-1/8" - 88-1/4"	65-3/8" - 93-1/2"
9.5L-15	51-1/4" - 71-3/8"	54-1/2" - 74-5/8"	55-1/4" - 79-3/8"	58-1/2" - 82-5/8"	61-1/4" - 89-3/8"	64-1/2" - 92-5/8"
10.00-16	51-3/4" - 71-7/8"	53-1/2" - 73-5/8"	55-3/4" - 79-7/8"	57-1/2" - 81-5/8"	61-3/4" - 89-7/8"	63-1/2" - 91-5/8"
11L-15 11.00-16	. . . . .	53-1/2" - 73-5/8"	. . . . .	57-1/2" - 81-5/8"	. . . . .	63-1/2" - 91-5/8"
11.2-24 12.4-24	. . . . .	. . . . .	. . . . .	64" - 88-1/8"	. . . . .	. . . . .
12.4-24C&R	. . . . .	. . . . .	. . . . .	68-1/8" - 88-1/8"	. . . . .	. . . . .
14L-16	. . . . .	57-3/8" - 77-1/2"	. . . . .	61-3/8" - 85-1/2"	. . . . .	65-1/8" - 93-1/4"
HI-CROP 7.50-20	. . . . .	. . . . .	60" - 84"	64" - 88"	. . . . .	. . . . .

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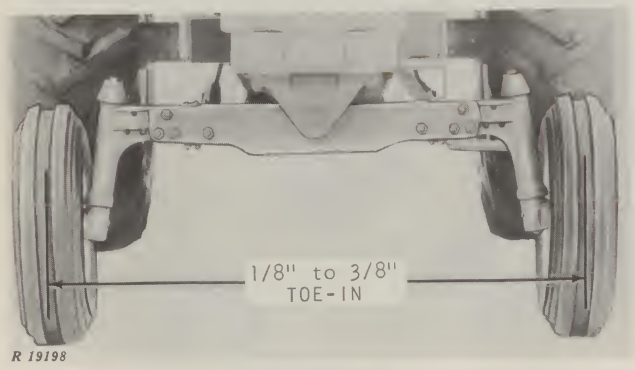
Adjustable Front Axle Tread Chart

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.

To adjust toe-in on adjustable tread axles, remove the bolts from the 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. The tie rods should be of equal length so that the tractor will turn as sharp to the left as it will to the right.

REAR WHEEL TREAD

Limit single rear wheel tread to 110 inches when pulling heavy loads (in first, second, and third gears) that generate high weight transfer loads or draft loads.

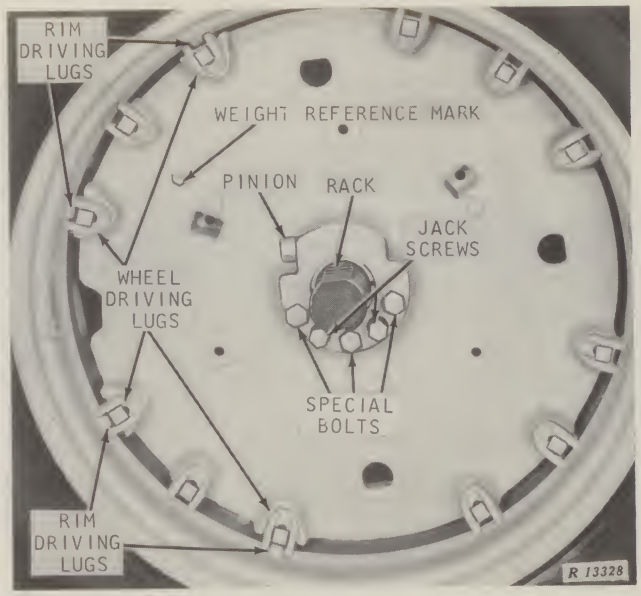
Regular and Offset Wheels

The tread can be changed by moving the wheel on the axle by the rack and pinion, by reversing the wheel on the axle, or by changing the rim position on the wheel.

Rack and Pinion Method

This method of adjustment is accomplished by turning a pinion gear in the wheel hub that engages a rack on the axle. See the illustration. This adjustment may be made with one or two wheel weights installed.

With the rack on the axle up, loosen the three special bolts 3/8 inch. Loosen the tapered sleeve by turning the two jack screws clockwise until the inner



Rack and Pinion Adjustment

edge of the hex. surface is flush with the hub surface. Jack up the tractor and turn the pinion gear to slide the wheel in or out on the axle.

IMPORTANT: Tires or weights should have at least one inch clearance with the fenders. Setting the wheels too close to the rear axle housing may damage the pinion when the hub is tightened. To avoid this, adjust the wheel to the innermost position until the pinion contacts the end of the rack. Then back up until the wheel has moved outward at least 1/8-inch or more if needed for fender clearance. Rack on axle must be up.

After the desired tread is obtained, back the jack screws all the way out against the stop. Do not force. Lubricate the threads and tighten the special bolts to 300 ft-lbs torque. Retighten bolts several times until all three bolts stay tightened to 300 ft-lbs torque. The jack screws must be free to turn after the hub is tightened. If necessary, back the jack screws out a little further and retighten special bolts.

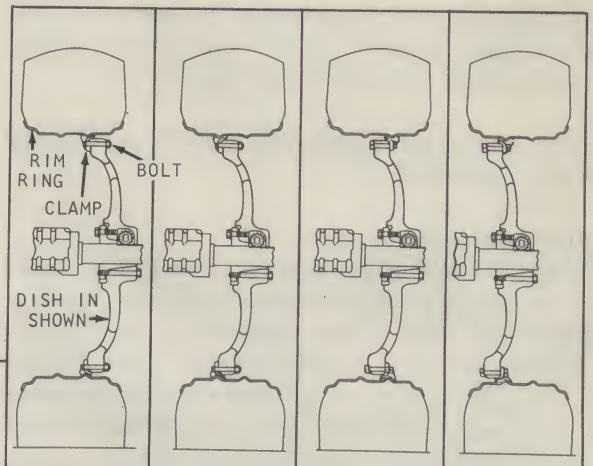
Adjust the other wheel in the same manner. Normally, both wheels are set the same distance from the tractor center line. AFTER driving tractor for approximately 20 revolutions of the wheel and BEFORE working, retighten the special bolts to 300 ft-lbs torque. After working tractor for approximately 3 hours and again at 10 hours, retighten the special bolts and keep them tight.

Changing Rim Position on Wheel

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

On offset deep well rims, two possible rim positions are obtained by reversing the offset deep well. Install tire and rim on other wheel for proper direction of tire rotation.

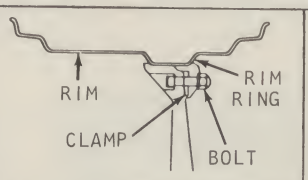
To change the position of the rim on the wheel, jack up the tractor until there is little or no weight on the tire. Remove the rim clamps and shift the rim or wheel to the desired position. Install the clamps and tighten evenly. Be sure that the clamps on the wheel driving lugs engage the rim driving lugs as shown in the illustration.

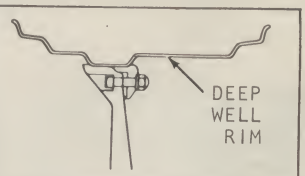


WHEEL TYPE	AXLE TYPE	OVERALL AXLE LENGTH	DISK POSITION				
REGULAR WHEEL	REGULAR AXLE	89-5/8"	– – – – –	60"-75"	68"-83"	67"-82"	75"-90"
	LONG AXLE	95-7/8"	– – – – –	61"-82"	68"-89"	67"-88"	75"-96"
	EXTRA LONG AXLE	103-7/8"	– – – – –	67"-89"	75"-97"	74"-96"	82"-104"
	SPECIAL AXLE	113-1/8"	– – – – –	67"-98"	75"-106"	74"-105"	82"-113"
OFFSET WHEEL	REGULAR AXLE	89-5/8"	DISH IN	60"-69"	62"-77"	61"-76"	69"-84"
			DISH OUT	69"-79"	77"-87"	76"-86"	84"-94"
	LONG AXLE	95-7/8"	DISH IN	60"-75"	62"-83"	61"-82"	69"-90"
			DISH OUT	70"-86"	78"-94"	77"-93"	85"-101"
	EXTRA LONG AXLE	103-7/8"	DISH IN	61"-84"	69"-91"	68"-90"	74"-98"
			DISH OUT	77"-94"	85"-102"	84"-101"	92"-109"
	SPECIAL AXLE	113-1/8"	DISH IN	61"-92"	69"-100"	68"-99"	74"-107"
			DISH OUT	77"-103"	85"-111"	84"-110"	92"-118"

R 20710 Minimum tread for 20.8-34 tire is 63".

Tread Chart for Tractors with Regular Rims (Double Rim Ring)





R 21791

		23.1-26	23.1-30	23.1-26	23.1-30
REGULAR AXLE	REGULAR WHEEL POSITION	66"-69"	66"-71"	71"-85"	72"-87"
	WHEEL REVERSED	66"-77"	66"-76"	84"-93"	82"-92"
LONG AXLE	REGULAR WHEEL POSITION	66"-75"	66"-77"	71"-91"	72"-93"
	WHEEL REVERSED	66"-83"	66"-82"	84"-99"	82"-98"
EXTRA LONG AXLE	REGULAR WHEEL POSITION	66"-83"	66"-85"	78"-99"	79"-101"
	WHEEL REVERSED	75"-91"	73"-90"	91"-107"	89"-106"
SPECIAL AXLE	REGULAR WHEEL POSITION	66"-92"	66"-94"	78"-99"	79"-110"
	WHEEL REVERSED	75"-100"	73"-99"	91"-116"	89"-115"

Tread Chart for Tractors with Deep Well Rims

Hammer each bolt head to seat the bolts. Retighten the clamps securely (170 ft-lbs torque). Adjust both rear wheels in the same manner.

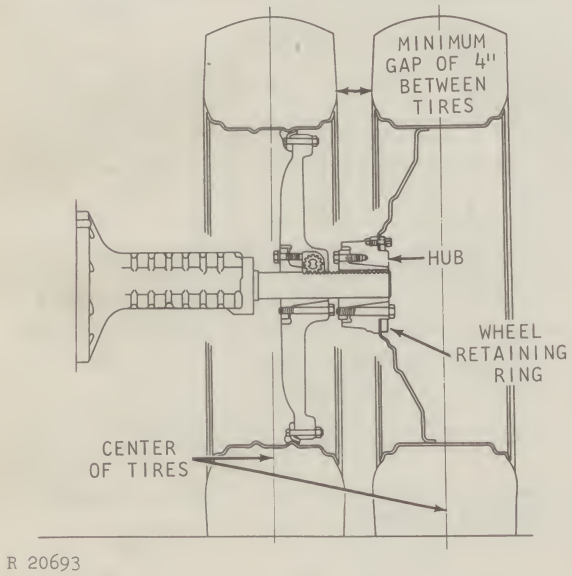
After a few hours service, RETIGHTEN the clamps and keep them tight.

Reversing Wheel on the Axle

On tractors with offset wheels or wheels for deep well rims the rear wheel tread may be changed by reversing the "dish" of the wheel. To do so, jack up the tractor, remove the snap ring at the end of the axle, move the wheel outward and remove the wheel and tire. Reverse the "dish" and install the wheel and tire on the other axle. Install the snap ring. Be sure to maintain proper direction of tire rotation.

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

Double Rear Wheels



R 20693

TIRE SIZE	REGULAR AXLE	*LONG AXLE	**EXTRA LONG AXLE	**SPECIAL AXLE
13.6	60"-98"	61"-105"	67"-112"	67"-122"
15.5	60"-102"	61"-109"	67"-117"	67"-125"
16.9	60"-105"	61"-111"	67"-119"	67"-128"
18.4	...	61"-112"	67"-120"	67"-129"
20.8	...	...	67"-117"	67"-126"

*Minimum tread for offset cast wheel is 60".
**Minimum tread for 20.8 tire is 63". On offset cast wheel with other tires, minimum tread is 61".

R-20712

Treads for Double Rear Wheel with Steel Disk Rim

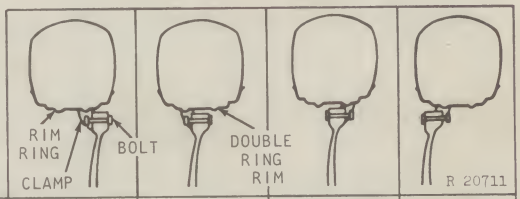
Use the tread chart on page 19 for double rear wheels with cast wheels. On double rear wheels with a steel disk rim, use the tread chart below at left. The minimum gap between a 15.5-38 inner tire and a 13.6-38 outer tire on a regular axle is 4 inches. On all other double wheels, the minimum gap should be 5 inches. Insufficient gap may damage the tires.

If the outer double rear wheel is removed when pulling heavy loads (in first, second, and third gears) that generate high weight transfer loads or draft loads, limit the rear wheel tread to 110 inches.

When outer wheel must be repositioned or removed, it is very important that the inner wheel rim clamp nuts and hub special bolts be securely tightened. The outer steel disk wheel retaining cap screws should be tightened to 80 ft-lbs torque. On tractors with retaining rings, tighten cap screws to 170 ft-lbs. Use retightening procedure for special bolts described on page 18.

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

Hi-Crop Tractors



REGULAR WHEEL	73"-82" *77"-82"	81"-90" 85"-90"	80"-89" 84"-89"	88"-97" 92"-97"
OFFSET WHEEL	73"-76" *82"-87"	75"-84" *90"-95"	74"-83" *89"-94"	82"-91" *97"-102"

* *Wheels reversed on the axle.*

Tread Chart for Hi-Crop Tractor

The tread settings for Hi-Crop tractors are shown in the above chart. See page 18 for instructions on changing rear wheel tread.

TIRES

Properly inflated tires are important to the operation of your tractor. The amount of air pressure to be carried in the front and rear tires depends upon the implement used with the tractor and the amount of ballast employed.

Keep the tires inflated according to the recommendations shown in the charts. Under-inflated tires break and wear out rapidly. Over-inflated tires reduce traction and increase wheel slippage.

INFLATION CHARTS

Front Tires			
		Inflation Pressure	
Tire Size	Ply Rating	With Towed or Rear-Mounted Implement	With Max. Ballast or Front-Mounted Implement
6.00-16	6	36 psi	48 psi
7.5L-15	6	36 psi	40 psi
7.5L-15	8	36 psi	52 psi
7.50-16	6	36 psi	40 psi
7.50-16	10	48 psi	60 psi
7.50-18	6	36 psi	40 psi
7.50-20	6	36 psi	40 psi
9.5L-15	6	28 psi	32 psi
10.00-16	6	28 psi	28 psi
11.00-12	12	40 psi	56 psi
11L -15	6	28 psi	28 psi
11.00-16	8	36 psi	36 psi
11.2 -24	6	26 psi	26 psi
12.4 -24	6	22 psi	24 psi

Rear Tires			
		Inflation Pressure	
Tire Size	Ply Rating	With Little or No Added Ballast	With Max. Ballast or Heavy Rear-Mounted Implement
13.6-38	* 6	16 psi	22 psi
15.5-38	6	16 psi	20 psi
15.5-38	8	16 psi	26 psi
15.5-38	10	16 psi	30 psi
16.9-34	6	16 psi	18 psi
16.9-34	8	16 psi	24 psi
16.9-38	8	16 psi	24 psi
18.4-26	6	16 psi	16 psi
18.4-30	6	16 psi	16 psi
18.4-34	6	16 psi	16 psi
18.4-34	8	16 psi	20 psi
18.4-38	6	16 psi	16 psi
18.4-38	8	16 psi	20 psi
20.8-34	6	16 psi	18 psi
20.8-34	8	16 psi	18 psi
23.1-26	8	16 psi	16 psi
23.1-30	8	16 psi	16 psi

** Double tires only. Operating with this 6-ply tire as a single tire will usually overload the tire and may cause a hazardous tire failure.*

BALLAST

The safety and performance of your tractor will be improved if the correct amount of front and rear ballast is used.

Sufficient front ballast is required to maintain stability and steering control when front weight is transferred to the rear wheels, particularly when pulling larger implements.

The amount of rear ballast should permit operation with approximately 10 to 15 percent slip of the rear wheels. Field tests show that under normal field conditions maximum drawbar horsepower is available when operating in this range.

Measuring Slippage

The following method may be used to measure rear wheel slip:

1. Mark a reference line on the side of the tire. Walk along side of the tractor while it is working and drop a marker where the chalk mark comes down to the ground.

2. Continue along side, count off 10 wheel revolutions, and again mark the spot where the chalk mark comes down to the ground.

3. With the implement out of the ground, drive the tractor between the marked spots, again marking the tire beside the marker on the ground. Count the wheel revolutions between the markers on the ground, estimating the last revolution as close as possible.

4. Determine the percent of slip from the revolutions obtained in Step 3.

Revolutions	Percent of Slip	Revolutions	Percent of Slip
10	0	8	20
9-1/2	5	7-1/2	25
9	10	7	30
8-1/2	15		

Add or remove ballast as required to obtain approximately 10 to 15 percent slip for the desired field operating condition.

Maximum Ballast

Maximum ballast used should be limited to the tire carrying capacity or the tractor operating capacity. Avoid ballasting to pull heavy loads in the lower gears over long periods of time. Tractor and tire life can be extended if the draft load for continuous operation does not exceed 4th gear capacity of a Power Shift or a syncro-range transmission or C1 speed of a Quad-Range transmission. Be sure to remove the additional ballast when it is no longer needed.

The following charts list the maximum tire carrying capacity (at 20 miles per hour). Do not exceed these capacities.

FRONT TIRE CARRYING CAPACITY

Tire Size	Ply Rating	Weight	Tire Size	Ply Rating	Weight
6.00-16	6	1260 lbs.	9.5L-15	6	1700 lbs.
7.5L-15	6	1590 lbs.	10.00-16	6	2140 lbs.
7.5L-15	8	1850 lbs.	11.00-12	12	2990 lbs.
7.50-16	6	1650 lbs.	11L -15	6	1900 lbs.
7.50-16	10	2100 lbs.	11.00-16	8	2920 lbs.
7.50-18	6	1790 lbs.	11.2 -24	6	2310 lbs.
7.50-20	6	1930 lbs.	12.4 -24	6	2640 lbs.

REAR TIRE CARRYING CAPACITY

Tire Size	Ply Rating	Weight	Tire Size	Ply Rating	Weight
13.6-38	6	3660 lbs.	18.4-34	6	4960 lbs.
15.5-38	6	3880 lbs.	18.4-34	8	5650 lbs.
15.5-38	8	4530 lbs.	18.4-38	6	5230 lbs.
15.5-38	10	4940 lbs.	18.4-38	8	5970 lbs.
16.9-34	6	4440 lbs.	20.8-34	6	5560 lbs.
16.9-34	8	5250 lbs.	20.8-34	8	6430 lbs.
16.9-38	8	5550 lbs.	20.8-34	8	6430 lbs.
18.4-26	6	4390 lbs.	23.1-26	8	6280 lbs.
18.4-30	6	4680 lbs.	23.1-30	8	6690 lbs.

Rear Ballast

If too much rear ballast is used, the tread marks will be clear and distinct. Overballasting results in less power available to pull the implement because more power is required to overcome tractor rolling resistance. It will result in unnecessary soil compaction, and may overload the tires. With too little rear wheel ballast, the tread marks will be obliterated by excessive slippage, indicating horsepower loss and excessive tire wear.

A compromise in ballasting may be necessary when the tractor is used to pull loads having different draft requirements. If the tractor is used most of the time pulling high draft loads (such as plowing or chiseling), ballast the tractor for this operation. However, if a large amount of time is spent on light load work or in the higher gears, more consideration should be given to ballasting for the light operating condition and permitting the slip to increase for the small amount of time spent on high draft work.

The power weight-transfer hitch is available for operation with heavy draft loads or with a wide variation of draft loads on tractors having relatively light rear ballast.

Cast-Iron Weights

When additional weight is required, cast-iron weights may be bolted to the inside or outside of the rear wheels.

Weights in 120 and 140-pound sizes are available from your John Deere dealer. The 140-pound weights are used on wheels with 34 or 38-inch rims or as additional weights on 30-inch rims when no interference exists between the weight and the rim.

To install weights with the weight hand holds in the horiztonal position, the weight reference mark on the wheel should be up (see illustration on page 18). To obtain wrench clearance for adjusting wheel tread, install weights with the reference mark on the rim of the weight next to the weight reference mark on the wheel.

When plowing, best results are generally obtained by placing more weight on the land wheel than on the furrow wheel.

Liquid Weight

Water and calcium chloride solution is an economical means of adding weight to the wheels. This solution, added in the tire inner tubes, will not damage the inner tube or tire if used in the proper porportions. The addition of calcium chloride is recommended to prevent the water from freezing.

Use of this method of weighting the wheels has the full approval of the tire companies. See your John Deere dealer for this service. The following chart lists the liquid weight each tire will hold when 75 percent full (filled to valve level).

LIQUID WEIGHT PER TIRE (75 PERCENT FILLED)

Tire Size	Slush-Free at 13° F.; Solid at −23°F. (Approx. 2 Lbs. $CaCl^2$ per Gal. Water)	Slush-Free at −12° F.; Solid at −52° F. (Approx. 3.5 Lbs. $CaCl^2$ per Gal. Water)	Slush-Free at −53° F.; Solid at −62° F. (Approx. 5 Lbs. $CaCl^2$ per Gal. Water)
6.00-16	57 lbs.	62 lbs.	63 lbs.
7.5L-15	77 lbs.	83 lbs.	88 lbs.
7.50-16	85 lbs.	92 lbs.	96 lbs.
7.50-18	93 lbs.	101 lbs.	107 lbs.
7.50-20	101 lbs.	110 lbs.	114 lbs.
9.5L-15	105 lbs.	112 lbs.	120 lbs.
10.00-16	165 lbs.	178 lbs.	187 lbs.
11.00-12	145 lbs.	154 lbs.	163 lbs.
11L -15	142 lbs.	153 lbs.	163 lbs.
11.00-16	217 lbs.	225 lbs.	248 lbs.
11.2-24	216 lbs.	228 lbs.	253 lbs.
12.4-24	280 lbs.	305 lbs.	334 lbs.
13.6-38	480 lbs.	520 lbs.	550 lbs.
15.5-38	611 lbs.	646 lbs.	677 lbs.
16.9-34	672 lbs.	722 lbs.	758 lbs.
16.9-38	848 lbs.	912 lbs.	974 lbs.
18.4-26	755 lbs.	805 lbs.	854 lbs.
18.4-30	848 lbs.	912 lbs.	960 lbs.
18.4-34	874 lbs.	936 lbs.	988 lbs.
18.4-38	1034 lbs.	1113 lbs.	1174 lbs.
20.8-34	1062 lbs.	1132 lbs.	1480 lbs.
23.1-26	1210 lbs.	1291 lbs.	1374 lbs.
23.1-30	1355 lbs.	1457 lbs.	1547 lbs.

Front Ballast

Front ballast may be required for stability and steering control when weight on the front wheels is transferred to the rear wheels, by implement action through the hitch, or power weight-transfer coupler.

Ballasting for Field Operation

The approximate total front tractor weight for normal field operation is as follows:

1. Approximately 1/3 of total tractor weight for operation of integral implements, semi-integral implements, or towed implements hitched to the power weight-transfer coupler.

2. Approximately 1/4 of the total tractor weight for operation of towed implements hitched to the tractor drawbar.

Ballasting for Transport

Add additional ballast if necessary for stability and safety during transport of heavy integral implements. Front end ballast may not always maintain the required stability if the tractor is driven too fast over rough ground with heavy rear-mounted tools in the raised position. Be safe and drive slowly under these conditions.

Determining Ballast From Implement Code System

John Deere engineers have developed an implement code system which shows the tractor operator how much front ballast is needed to provide adequate stability when transporting rear hitch-mounted implements. This coding system is applicable to all John Deere tractors (using John Deere weights mounted in standard location) and implements currently being manufactured.

To use the new coding system, refer to the ballast section in implement operator's manual to obtain the special ballast code number which applies to the implement (and its attachments) being used. Determine the number of weights required corresponding to the code number from the chart on the following page. For example, the total implement code number from the implement operator's manual is 150. The tractor is equipped with Roll-O-Matic front end, liquid ballast in front tires, and a Quik-Coupler. Subtract 10 from the code number for liquid ballast in front tires, and add 32 for the Roll-O-Matic front end plus 13 for the Quik-Coupler. The adjusted implement code number for determining front ballast from the chart is now 185. If single row front weights are selected, the side weights and 8 front weights should be used. If double row front weights are selected, use the weight supports, a double front weight, and 6 front weights. If Quik-Tatch front weights are selected, use the weight support and 6 Quik-Tatch front weights.

A Careful Operator
IS THE BEST INSURANCE AGAINST AN ACCIDENT

X 1286

** The following charts are for a 4230 tractor with an adjustable tread front axle, no liquid ballast in front tires, and without a Quik-Coupler.*

SINGLE ROW FRONT WEIGHTS

Implement Code Number*	Weights Required	
	Side Weights	Front End Weights
0-136	No	None
137-145	Yes	None
146-150	Yes	1
151-156	Yes	2
157-161	Yes	3
162-166	Yes	4
167-172	Yes	5
173-177	Yes	6
178-183	Yes	7
184-188	Yes	8

DOUBLE ROW FRONT WEIGHTS

Implement Code Number*	Weights Required	
	Weight Supports And Double Front Weight	Front End Weights
0-136	No	None
137-142	Weight Supports Only	None
143-155	Yes	None
156-160	Yes	1
161-165	Yes	2
166-171	Yes	3
172-176	Yes	4
177-181	Yes	5
182-186	Yes	6
187-192	Yes	7
193-197	Yes	8
198-203	Yes	9
204-209	Yes	10
210-214	Yes	11
215-219	Yes	12
220-225	Yes	13
226-231	Yes	14

QUIK-TATCH FRONT WEIGHTS

Implement Code Number*	Weights Required	
	Weight Support	Quik-Tatch Weights
0-136	No	None
137-144	Yes	None
145-157	Yes	2
158-176	Yes	4
177-185	Yes	6
186-199	Yes	8
200-212	Yes	10

NOTE: If your tractor is different than the tractor specified at left, adjust the code given in the implement operator's manual as follows:

Subtract 10 if front tires contain liquid ballast.

Add 13 if using a Quik-Coupler.

Add 32 if tractor has a double front wheel, Roll-O-Matic, or a single front wheel.

Determining Ballast Without Implement Code System

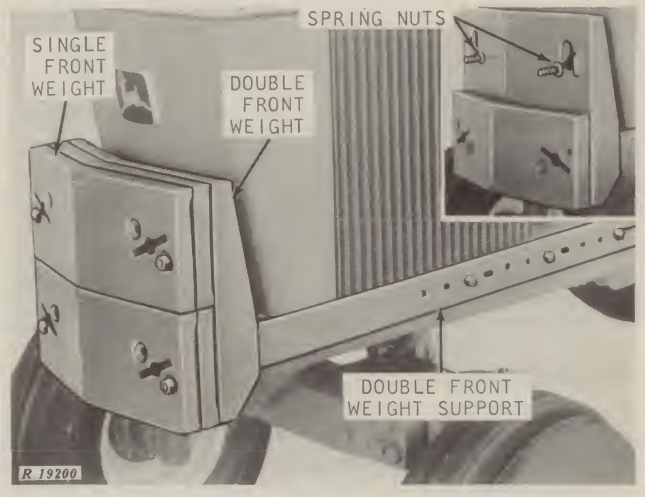
If your implement operator's manual does not show an implement code number, use the information on ballasting given in implement manual to achieve stability and steering control during transport.

Single Front Weights

Two side weights and up to eight single front weights may be added. Each weighs 85 pounds.

The side weights are installed first. The single front weights stack on the front portions of the two side weights. Rotate each weight 180 degrees with respect to the preceding weight to line up the mounting holes.

Double Front Weights

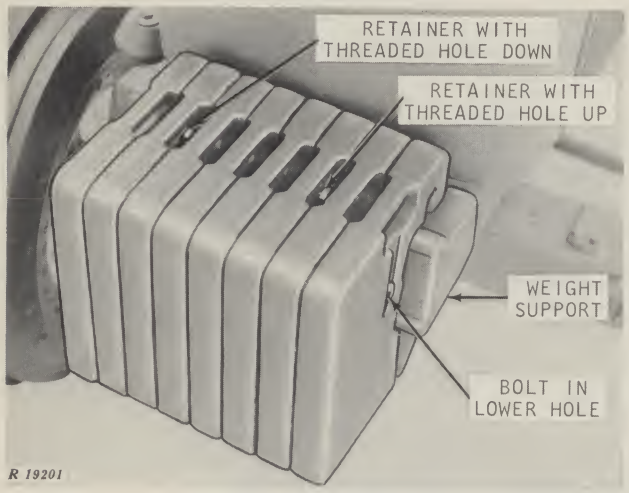


Double Front Weights

One double front and up to two rows of seven single front weights each may be added. Each double front weight support weighs 50 pounds. The double front weight weighs 220 pounds.

Install the double front weight supports first. Tighten the front support attaching bolts to 300 ft-lbs torque. Install the double front weight. Use the long single weight attaching bolt to mount the first single weight in each row. Install the spring nut on this bolt to prevent it from slipping out of position when mounting the first single weight.

Quik-Tatch Front Weights



Quik-Tatch Front Weights

One Quik-Tatch weight support and up to 10 Quik-Tatch front weights may be added. The weight support weighs 115 pounds and each Quik-Tatch weight weighs 103 pounds.

Install the weight support first and tighten the attaching screws to 300 ft-lbs torque. Install the Quik-Tatch weights in pairs with an equal number on each side of the weight centering boss on the bottom of weight support.

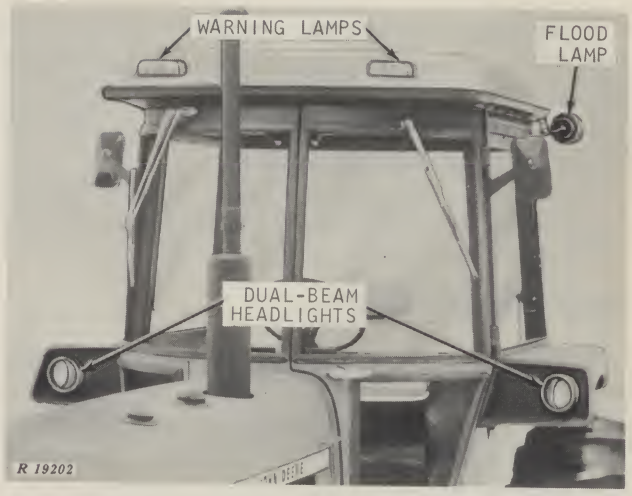
When 8 or 10 weights are installed, use the bolts that pass through 6 weights and the retainers, one retainer with the threaded hole down and one retainer with the threaded hole up. Tighten the retainer bolts to 170 ft-lbs. torque.

LIGHTS

The lights on your tractor are designed to give the maximum amount of safety and convenience when operating at night or during other periods of low visibility.

Headlights

The tractors have sealed, dual-beam headlights. A foot-operated dimmer switch is used to switch between high and low beams. A hi-beam indicator light on the instrument panel glows when the lights are on high beam.



Tractor Lights

Front flood lamps are available from your John Deere dealer.

Taillights

A red taillight is mounted at the rear of each fender. A reflector is incorporated in the outer portion of each taillight lens.

Flashing Warning Lamps

The tractor has flashing warning lamps that glow amber to the front and rear of the tractor. When a flashing light is prohibited by local regulations, wire the lamp to burn continuously when the light switch is in the "W" or "H" position. See page 68.

Turn Signals

Turn signals use the flashing warning lamps to indicate to operators of other vehicles your intention to turn right or left.

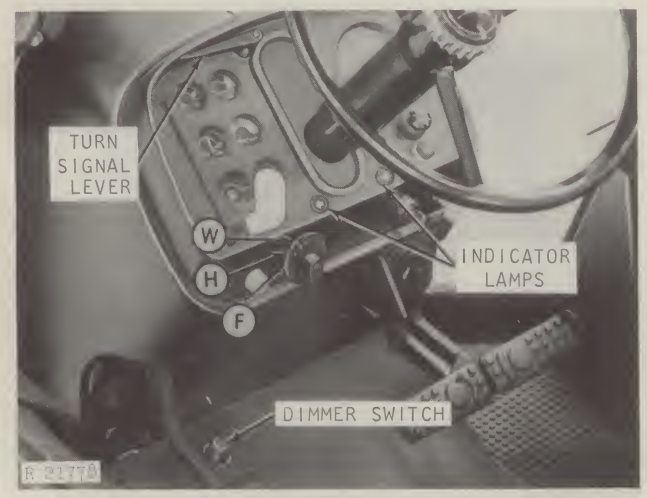
Push the turn signal lever upward to signal a right turn. The indicator lamp on the instrument panel and the right-hand warning lamps will flash to signal the turn. The left-hand warning lamps burn steady. Pull the lever down to signal a left turn.

After completing a turn, ALWAYS move the turn signal lever to the center (off) position for normal warning lamp operation.

Rear Flood Lamps

Tractors with a 4-post Roll-Gard or with a Sound-Gard body have two rear flood lamps at the roof. Other tractors have a rear flood lamp at the rear of the right-hand fender.

Light Switch



Light Switch

The tractor light switch has four positions:

OFF - To turn of all lights.

W - To turn on the warning lamps.

H - To turn on the dual-beam headlights, warning lamps, and red taillights.

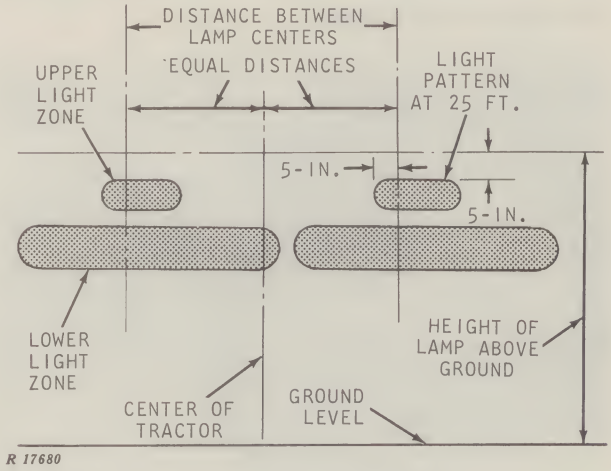
F - To turn on the dual-beam headlights and the flood lamps.

Adjusting the Headlights

CAUTION: Your tractor headlights should be checked periodically for proper adjustment.

To adjust the lights, position the tractor on level ground so the lights are 25 feet from the wall of a building with the tractor's centerline perpendicular to the wall. Use the steering column and hood ornament to find the tractor centerline.

Check the adjustment of the dual-beam headlights. Turn the light switch to the "F" position. Depress the dimmer switch until the lights are on low beam (hi-beam indicator light should also be out). There will be an upper and a lower high intensity zone on the wall as shown by the illustration. The top edge of the upper high intensity light zone should be 5 inches lower than the height of the lamp above the ground. The left edge of the upper zone should be 5 inches to the left of the lamp's vertical centerline. If adjustment is necessary, loosen the nut at the rear of the lamp. When the lamp is adjusted correctly, tighten the nut securely while holding the light in this position.



Tractor Headlight Adjustment

Implement Warning Lamp

This lamp, which glows amber to the front and to the rear, mounts securely on the left-hand side of the implement. The lamp, which is equipped with a flasher, is available from your John Deere dealer.

The lamp is connected to the electrical outlet socket and is lighted as long as it is connected.

Electrical Outlet Socket

This socket, a source of 12-volt d.c. electrical power, is used for plugging in the implement warning lamp, auxiliary lights, or other electrical equipment. The outlet socket, available from your John Deere dealer, is located at the rear of the tractor.

HIGHWAY DRIVING

When transporting (or driving) the tractor on a road or highway at night or during the day, use accessory lights and devices for adequate warning to the operators of other vehicles. In this regard, check local governmental regulations. Various safety lights and devices are available from your John Deere dealer.

When driving on the highway, be sure the lights are adjusted so they will not blind the operator of an oncoming vehicle.

Always dim the tractor headlights when meeting a vehicle at night by depressing the foot-operated dimmer switch (hi-beam indicator lamp should be out).

When driving a low profile tractor on a road or highway, be sure the flashing warning lamps are raised so they will be visible to operators of other vehicles.

IMPLEMENT HITCH AND CONTROL SYSTEM

The implement hitch and control system on your tractor provides a quick and easy means for attaching and lifting various implements and for controlling their operation.

The system may include a hydraulically operated rear rockshaft, a Power Weight-Transfer or a Universal 3-Point Hitch (tractor must have a rockshaft), one, two, or three remote hydraulic cylinders, a drawbar, or a power take-off.

CAUTION: Escaping hydraulic oil under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

ROCKSHAFT

The rear rockshaft can be used to raise, lower, and control a wide variety of integral implements and 3-point hitch tools.

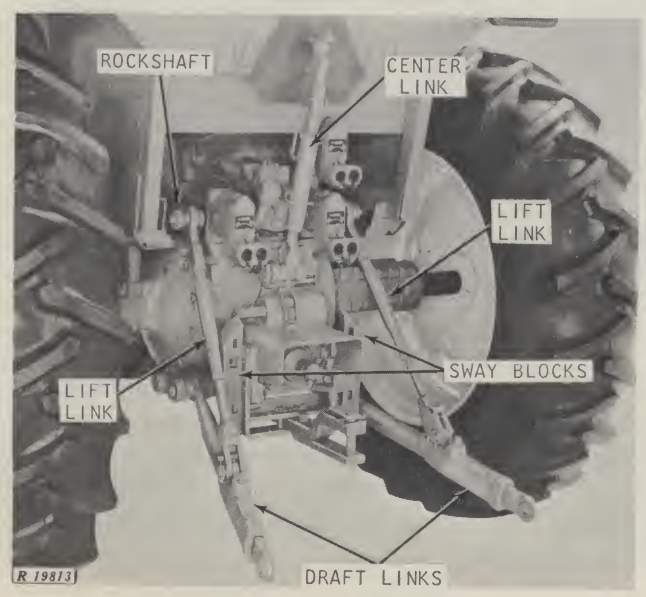
The rockshaft is controlled by the rockshaft control lever and the rockshaft selector lever. The rockshaft may be operated whenever the tractor engine is running.

The rockshaft selector lever (page 28) is used to determine how sensitive or responsive the implement control system will be to the implement load or draft.

When in the "ZERO" (depth control) position, the implement attached to the 3-point hitch will work at the depth selected by the rockshaft control lever regardless of the amount of pull required. When in the "MAX" (maximum load control) position, the rockshaft automatically raises or lowers the hitch and implements to maintain a constant load through variations in soil density or ground contour.

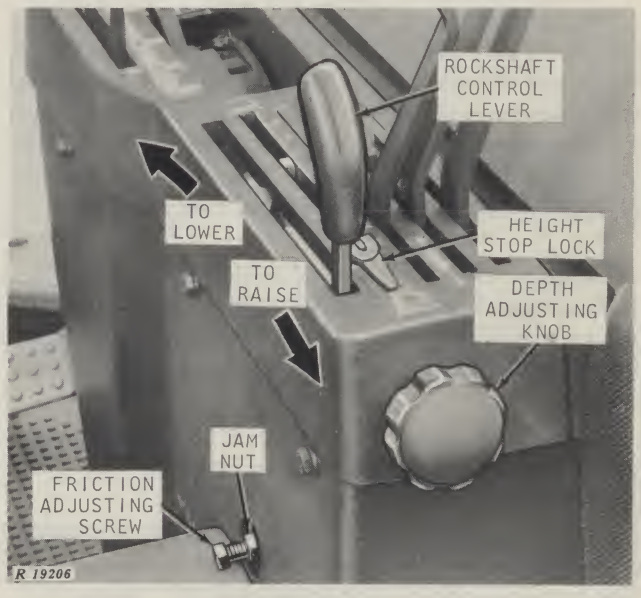
The positions in between "ZERO" and "MAX" are a combination of depth control and load control and determine how responsive the hitch will be to variations in the implement draft load. Use these positions to maintain a more uniform working depth when soil conditions vary or when passing through hills and swales. If an implement such as a chisel plow or a sub-soiler chatters, move the selector lever nearer to the "ZERO" position.

Load sensing for this system is accomplished through the 3-point hitch draft links on all tractors except the Hi-Crop tractor, which senses the load through the center link.



Rockshaft and Universal 3-Point Hitch

Using Rockshaft Control Lever



Rockshaft Control Lever

The rockshaft control lever is located in the control console at the right of the seat. To lower the rockshaft and the attached implement, move the lever forward.

To raise the implement, pull the rockshaft control lever rearward.

After a few minutes of operation to determine the desired position of the rockshaft, set the adjustable depth stop to limit the forward movement of the rockshaft control lever. Then each time the control lever is moved to the stop the implement will return to the same depth. Turn the depth-adjusting knob to move the stop to a new position.

The implement may be lowered further without shifting the depth stop by moving the control lever to the left-hand side of the slot and pushing the lever further forward.

The quadrant has a safety stop in the full raised position to prevent inadvertent lowering of the implement. To lower the implement, move the lever to the left and push it forward. The scale beside the lever serves as a guide when setting the lever or the depth stop.

To obtain floating action for rockshaft controlled implements with gauge wheels, place the rockshaft selector lever located near the bottom of the console in the "ZERO" position and push the control lever all the way forward in the quadrant.

The rockshaft height stop (available from your dealer) may be used to limit rockshaft lift. To prevent damage to mounted PTO-driven equipment, place the rockshaft selector lever in the "ZERO" position, raise the stop lock and slide the stop forward to the new position. If the stop slips when it is locked, tighten it by raising the lock and turning it 1/2 turn clockwise.

To tighten the friction holding force on the rockshaft control lever, loosen the jam nut and turn the friction adjusting screw out until a 5-pound force on the knob is required to move the lever. Tighten the jam nut.

Setting Rockshaft Selector Lever

The rockshaft selector lever located at the inside edge of the console is used to select the amount of load response of the hitch (see page 27). There are 7 detent settings from the upper position (MAX) for maximum load response to the lower position (ZERO) for depth control with no load response. To move the lever, push in on the lever and hold it in while moving it to the new position.

Rockshaft Selector Lever

Place the lever in the "ZERO" position before attaching an implement to the hitch or when limiting rockshaft lift with a height stop.

Adjusting Speed-of-Drop

Rockshaft Speed-of-Drop Adjustment

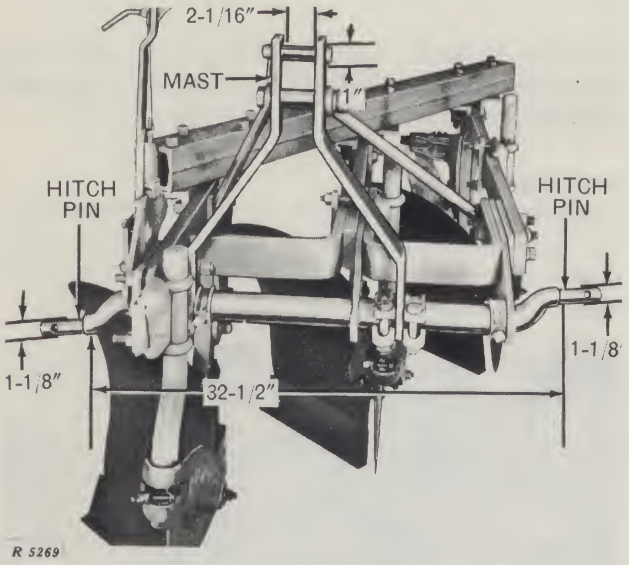
The speed at which the rockshaft and implement will drop is controlled by the valve on the rockshaft piston cover. Loosen the lock nut on the valve and turn the valve in to decrease or out to increase the speed of drop. Tighten the lock nut when the speed of drop is correct.

UNIVERSAL 3-POINT HITCH

The 3-point hitch consists of a center link, draft links, and lift links. The rockshaft operates the 3-point hitch.

Preparing Hitch for Category 1 or 2 Implement

Two classes of implements, referred to as category 1 and category 2, may be attached to a tractor with a 3-point hitch. Implements are grouped in these categories according to the dimensions of their hitch attaching points.



Category 2 Implement Hitch Dimensions

Distinguishing Dimensions	Category 1 Implement	Category 2 Implement
Diameter of hitch pins	7/8"	1-1/8"
Distance between shoulders of hitch pin	26-7/8"	32-1/2"
Gap in top of mast	* 1-3/4"	2-1/16"
Diameter of holes in top of mast	3/4"	1"

** If tractor has long forged draft links, increase gap to 2-1/16 inches.*

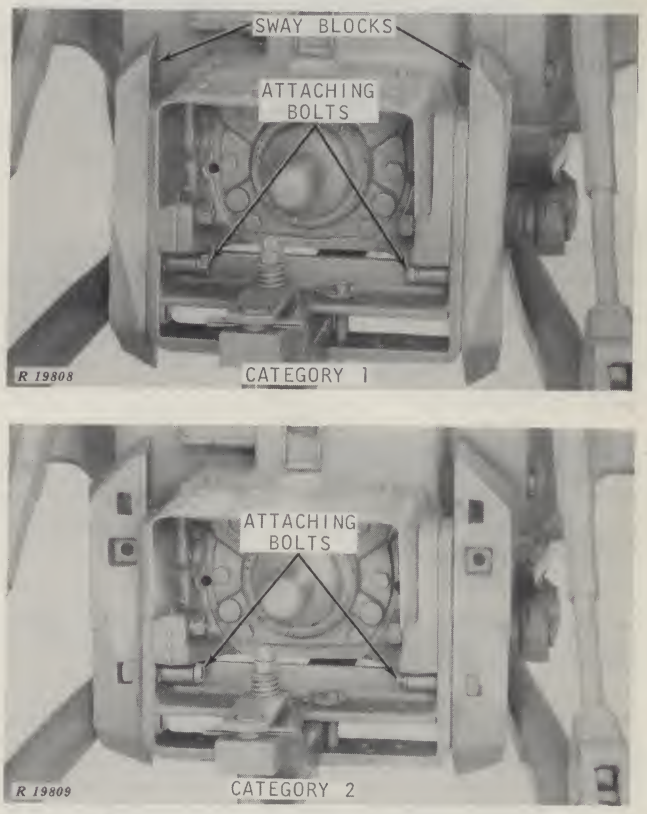
The 3-point hitch is normally equipped to attach a category 2 implement.

Before attaching a category 1 implement to the 3-point hitch, install bushings in the draft link attaching holes to accommodate the smaller 7/8-inch diameter hitch pins. See your John Deere dealer for these adapting parts.

Positioning Sway Blocks

Sway blocks control 3-point hitch and implement side motion. The words "LEFT" and "RIGHT" on the two blocks indicate the proper side of the tractor drawbar support to which each is attached.

Before attaching an implement to the 3-point hitch, make sure the sway blocks are installed properly. Refer to the implement operator's manual for proper sway block location.

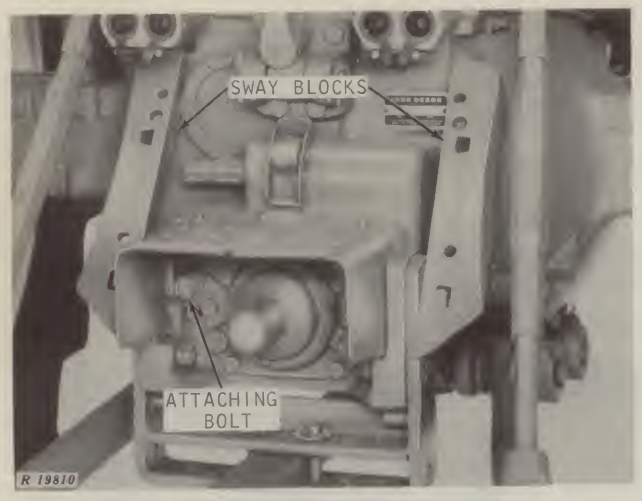


Sway Blocks Installed to Eliminate Side Sway

If a category 1 implement is to be attached, each sway block is installed with the wide flat surface facing the drawbar support.

If a category 2 implement is to be attached, each sway block is installed with the narrow flat edge facing the drawbar support.

The sway blocks can be installed in two positions for each implement category. When they are installed downward, along the sides of the drawbar support, they will eliminate implement side sway, whether the implement is in working position or in transport position. For some implements it will be necessary to install sway block shims, available from your dealer, between the sway blocks and the tractor drawbar support. Use the shims when the sway blocks are in the down position only.



Sway Blocks in Upper Position to Permit Side Sway When Implement Is Working (Category 2 Implement)

When the sway blocks are pivoted upward as shown in the illustration, they permit the implement to sway when it is lowered for work. The sway blocks will eliminate side sway when the implement is raised for transport.

Attaching Implement to 3-Point Hitch

(1) Set the drawbar in the short, high position. See page 39. If necessary, lock it at the extreme left-hand side of the support.

(2) The master shield may have to be removed to attach a short-coupled implement. See page 34.

(3) If the implement requires a different lift link adjustment, measure and adjust the lift links.

(4) MAKE SURE THE SELECTOR LEVER IS IN THE "ZERO" POSITION (page 28).

(5) Back up the tractor until the draft links of the 3-point hitch are approximately in line with the implement hitch pins. Place the transmission in PARK. Raise or lower the draft links by means of the rockshaft control lever, if necessary.

Attaching Draft Links

(6) Pull up on the lock pins on the draft links and extend the telescoping draft links rearward.

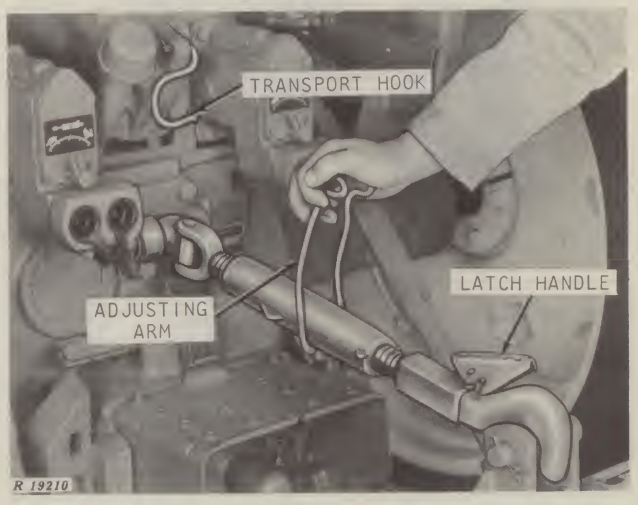
(7) Raise the draft link ends by hand and slip the swivel ball sockets over the hitch pins. Lock them in place with the "Quik-Lock" pins provided. When not in use, store each "Quik-Lock" pin in the large hole in the pins which fasten the lift links to the draft links.

(8) Lock the telescoping draft links in operating position by backing up the tractor and raising and lowering the hitch. Be sure that the lock pins snap into place. For satisfactory hitch operation, the draft links must not bind on the sway blocks.

Extending Draft Link Rearward

Attaching Center Link

(9) Remove the center link from the transport hook. Lift up on the center link latch handle and place the center link hook on the implement mast ball. Lock the hook to the mast ball by releasing the latch handle.



Adjusting Center Link

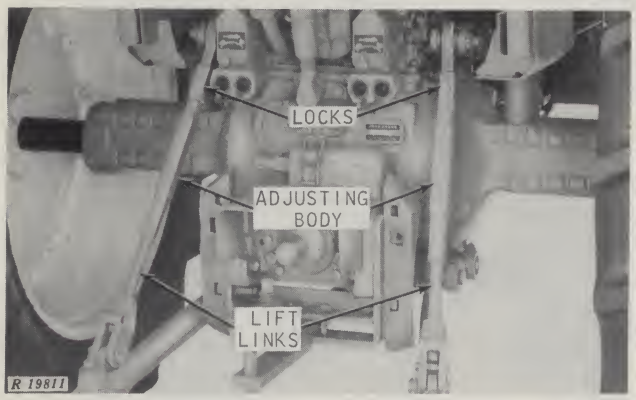
If it is necessary to adjust the length of the center link, pull up the adjusting arm and, with the arm at right angle to the body, rotate the body to lengthen or shorten the center link. Normal length is 28 inches. Center link range of adjustment is 3-3/8 inches. After center link is at proper length, push the arm down to lock it in place.

If implement will interfere with the rubber strap between the right-hand and left-hand lift links, store the strap by unhooking it from the left-hand lift link and hooking it over the lock at the top of the right-hand lift link.

(10) Raise the implement slowly and check for any point of interference. Make adjustments if necessary. Set the height stop (available from your dealer) when required to prevent damage to PTO-driven machine linkage.

(11) Move the rockshaft selector lever to the desired position, usually half way up in the quadrant. After a few minutes of field operation, readjust the lever for more or less load response.

Adjusting Lift Links

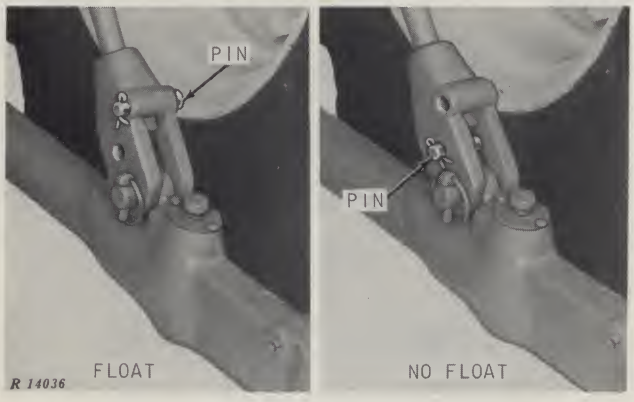


Lift Links

The normal lift link length from center of pin to center of pin is 32-1/4 inches with an adjustment range of 1-3/4 inches. Do not extend lift link beyond adjustment range.

To adjust the lift link, raise the lock and turn the adjusting body. If desired, a wrench may be used on the hexagon surface of the body. After adjusting, slide the lock down until its slots engage the body and prevent the body from turning.

Adjusting for Lateral Float



Implement Float Adjustment
(Tractor with Forged Draft Links)

Provision is made to allow for lateral float of implements equipped with gauge wheels, permitting one side of the implement to follow the ground contours without affecting the other side.

To allow the implement to float, install the pins in the upper holes in the lower lift-link-to-draft-link yokes. To prevent float, install the pins in the lower holes in the yokes.

Leveling the Implement

To level the implement LATERALLY (from side to side), it may be necessary to adjust the length of a lift link. After making the adjustment, make sure the lock is down in place.

To level the implement FORE-AND-AFT, it may be necessary to adjust the length of the center link by means of the adjusting arm. After the implement is leveled, lock the adjusting arm in place. See the implement operator's manual for the recommended adjustments.

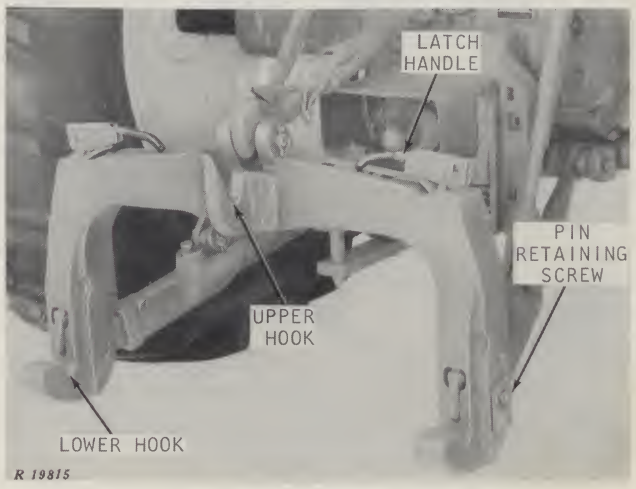
Quik-Coupler

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 and adapters 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.

⚠ CAUTION: Tighten pin retaining screws to 85 ft-lbs torque on a heavy duty cast Quik-Coupler to prevent coupler disconnecting from hitch.



Heavy Duty Quik Coupler

Attaching Implement to Quik-Coupler

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

Lift the latches to the vertical position to lock them in the released position. Lower the hitch assembly until the attaching hooks are lower than the implement hitch pins.

Back the tractor up until the implement hitch pins enter the lower hooks and the upper hook is behind the pin between the sides of the implement mast. Slowly raise the rockshaft to engage the implement. Push inward on the handles so that the latch handles are horizontal against the coupler frame to lock the implement to the coupler.

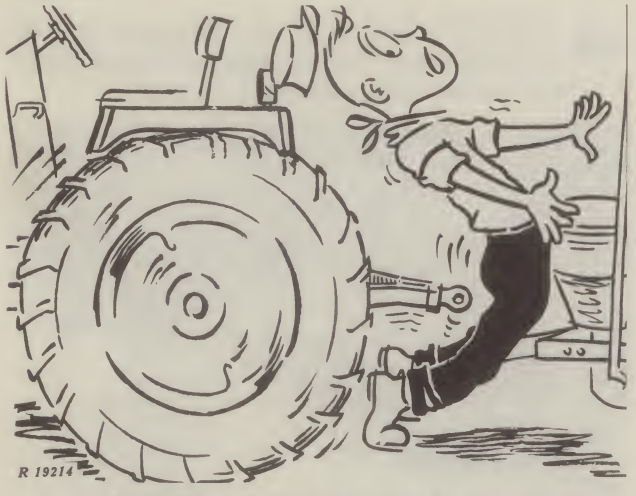
⚠ CAUTION: When the latches are properly locked, the latch handles will be horizontal and against the coupler frame.

IMPORTANT: Do not attach a drawbar towed load to the 3-point hitch and Quik-Coupler. Such implements should be hitched to the Power Weight-Transfer Hitch drawbar or the tractor drawbar only.

Removing Implement from Quik-Coupler

To remove most implements, raise the rockshaft far enough to reach the latches. Raise the handles to the vertical position to lock them in the released 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.

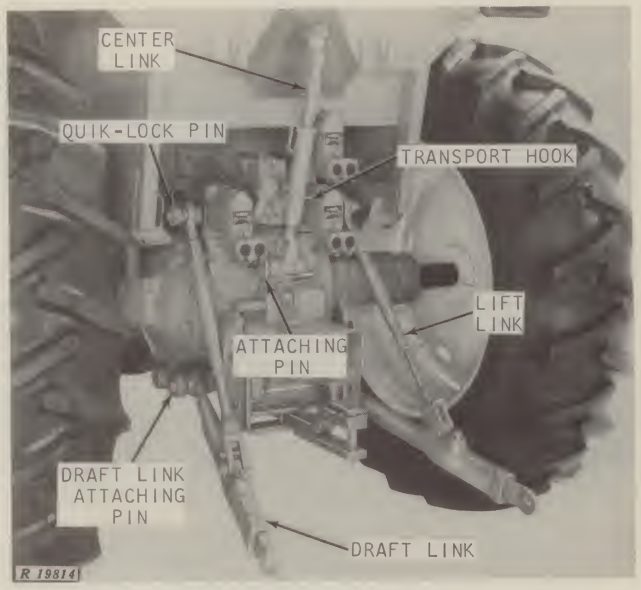


⚠ CAUTION: Do not stand between the tractor and implement unless the transmission is in PARK to hold the tractor stationary.

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.



3-Point Hitch Removal

Detach the top end of each lift link from the rockshaft arms by removing the "Quik-Lock" pins and lift link attaching pins from the rockshaft lift arms. Remove the draft links with lift links.

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.

POWER WEIGHT-TRANSFER HITCH

The Power Weight-Transfer Hitch transfers weight from a drawn implement and the tractor front end to the tractor rear wheels as it is needed to provide traction. When operation varies between light and heavy loads, the Power Weight-Transfer Hitch eliminates using heavily weighted rear wheels for light-load operations.

For most draft conditions, no added rear wheel ballast is required. Since front weight is transferred to the rear wheels, add eight Quik-Tatch weights, eight single front weights, or more if a double front weight is installed, to the tractor front end.

Power Weight-Transfer Pressure Gauge

Power Weight-Transfer Pressure Gauge

The Power Weight-Transfer Pressure Gauge indicates that weight is being transferred and is mounted at the rear of the control console.

During normal operation, pull the rockshaft control lever rearward until the gauge pointer moves clockwise in the green band for weight transfer operation. Weight transfer increases as the hand moves upward.

Operating with the gauge hand beyond the Weight-Transfer band usually results in an unstable operation with little added effective weight transfer.

The gauge will also show hydraulic oil pressure at the rockshaft to monitor hitch operation when using 3-point hitch implements with the rockshaft selector lever positioned to obtain load response. No pressure fluctuations indicate that the rockshaft control lever is set deeper than the implement is working. Move the lever slightly rearward to obtain some hydraulic pressure. If satisfactory working depth is difficult to maintain, see your implement operator's manual.

Installing Power Weight-Transfer Hitch Coupler

Remove the PTO master shield and the 3-point hitch center link. Adjust lift link length to 32 inches. Move the drawbar to the shortest position.

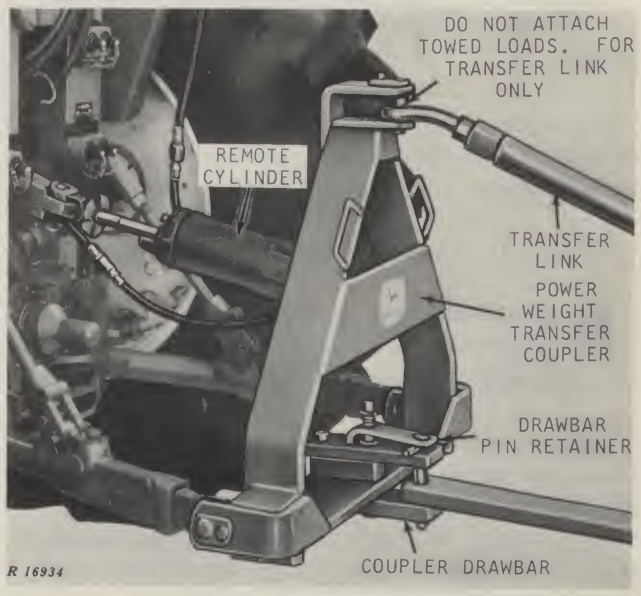
⚠ CAUTION: PTO guard must be in place over the PTO shaft.

Install sway blocks downward in the category 2 position. This position prevents coupler side motion and gives implement stability when towing implements on the highway.

If some coupler drawbar side motion is desired, pivot the sway blocks upward only during field operation.

Connect the piston rod end of a 3 x 8-inch hydraulic stop remote cylinder with attaching pivot to the center link attaching bracket.

Remove the dust protectors and wipe clean the remote cylinder hose ends and hose receptacles. Push the oil return receptacle sleeve forward and connect the hose from the stop rod side of the cylinder to the receptacle. Release the sleeve to lock the hose to the coupler. Connect the other hose (which supplies oil to the rod end cylinder) to the pressure receptacle on the Power Weight-Transfer Hitch control valve.



Power Weight-Transfer Hitch Coupler

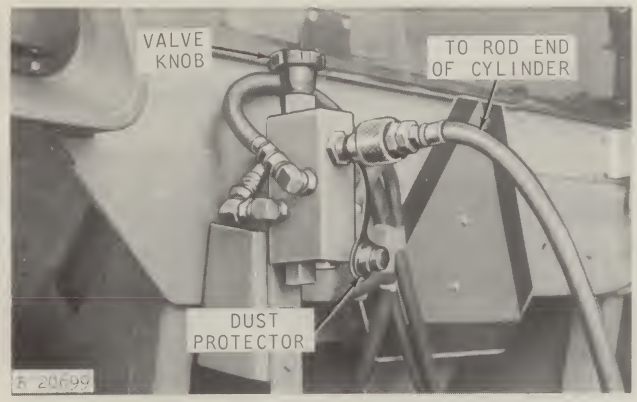
Attach Power Weight-Transfer coupler to the draft links using the spacer washers at the outside edge of the draft link balls between the draft link balls and the coupler.

Connect remote cylinder to the coupler.

Attaching Implement to Coupler

If not already equipped, install a Weight-Transfer link attaching bracket to a structural member of the implement. Position the bracket as near as possible in the line of draft between the top of the coupler and the center of implement ground engagement. See your implement operator's manual.

Place rockshaft selector lever in "ZERO" position.



Control Valve

Turn the Power Weight Transfer Hitch control valve knob all the way counterclockwise to the rockshaft position.

Raise the coupler with the rockshaft control lever until the coupler drawbar is as high as the regular tractor drawbar (draft links should be nearly level).

Connect the implement hitch to the drawbar.

⚠ CAUTION: Always place the drawbar pin retainer over the drawbar pin to prevent accidental implement disconnection during operation.

Connect the adjustable end of the weight-transfer link to the top pin of the coupler and the sliding end to the implement. ONLY the weight-transfer link should be attached to the top coupler pin. Tighten securely the attaching pin retaining screws for the coupler draft link and the weight-transfer link.

Turn the control valve operating knob all the way clockwise to the Weight Transfer position. Move the rockshaft selector lever to the "MAX" position.

With the implement at working depth, loosen the upper eyebolt lock nut and adjust the Weight-Transfer link until the coupler frame is nearly vertical. The remote cylinder will be at mid-stroke to allow movement when passing over hills and swales. The link is adjustable between 38 and 62 inches. Do not adjust link beyond 62 inches. A separate link for each implement will eliminate link readjustment when changing implements.

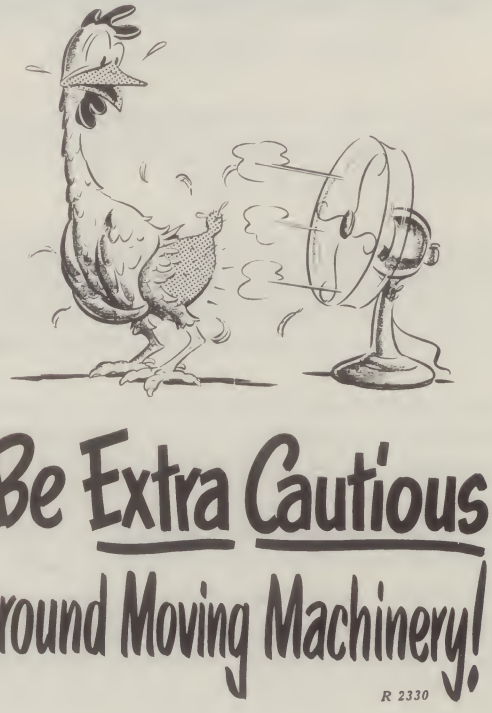
Removing Power Weight-Transfer Hitch Coupler

Disconnect the remote cylinder hoses and install the protective dust plugs and caps.

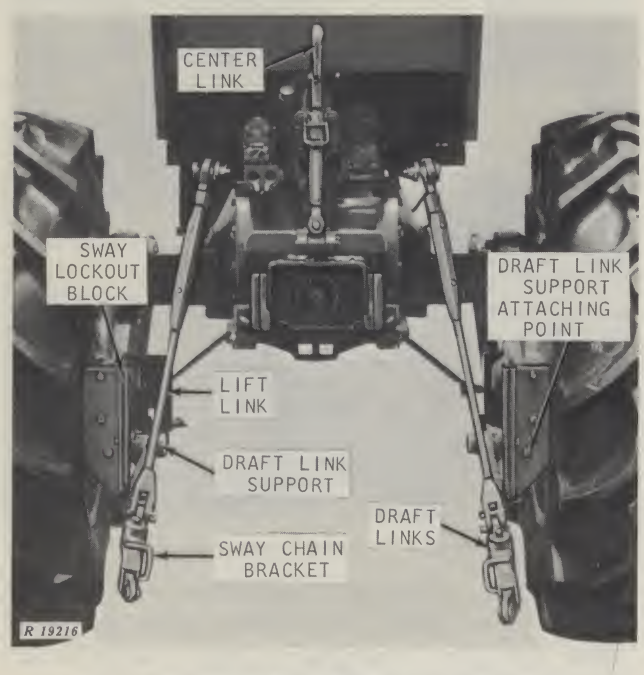
Move the rockshaft control lever all the way forward. Turn the Power Weight-Transfer control valve operating knob counterclockwise to the rockshaft position.

Remove the coupler and the remote cylinder.

Install the PTO master shield and the 3-point hitch center link.



HI-CROP 3-POINT HITCH



Hi-Crop 3-Point Hitch for Wide Clearance Implement

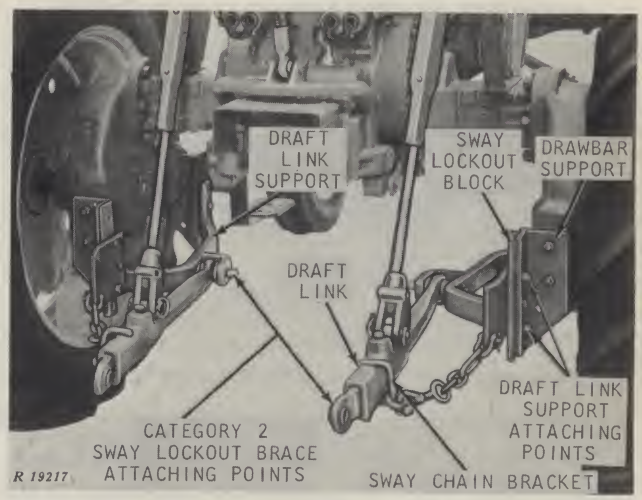
The Hi-Crop 3-point hitch provides a fast, easy means of attaching integral implements such as cane tool implements, tool carriers, and modified category 1 and category 2 implements with 29 or 30 inch mast.

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 and 2 draft link supports in the second and fourth 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.



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

Attach the upper ends of the lift links to the rockshaft lift arms. 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 27 through 31.

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

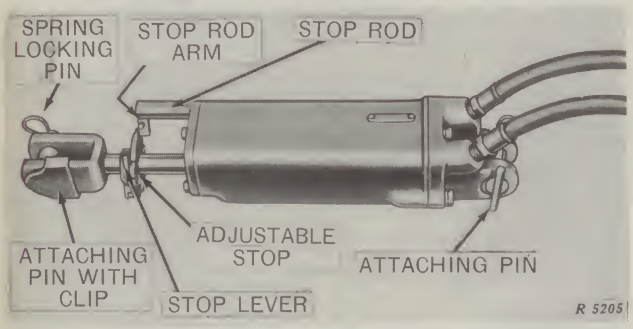
Attach the draft link and center link to the implement. To attach wide clearance implements, the sway lockout blocks may have to be removed.

After the implement is attached, slowly raise it to transport position and check for interference. On category 1 and 2 implements, adjust the sway chain length to permit only a slight amount of sway when raised.

To eliminate all 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 links may be adjusted between 42-1/4 and 45-3/4 inches. Center link may be adjusted between 23 and 29-3/4 inches.

REMOTE HYDRAULIC CYLINDERS

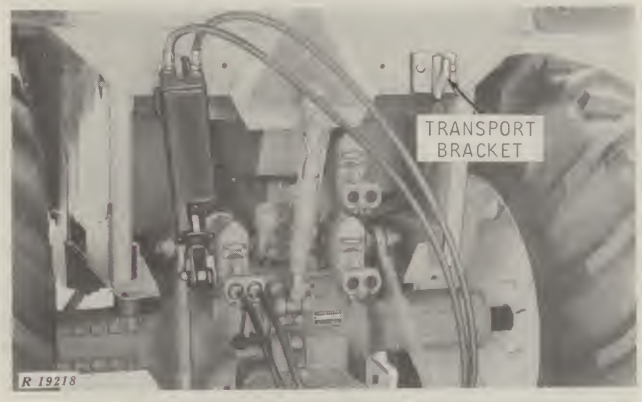


Hydraulic Stop Remote Hydraulic Cylinder

Your tractor may be equipped to operate 1, 2, or 3 single-acting or double-acting remote hydraulic cylinders. The cylinders are connected by hoses to the 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 to the breakaway couplers by the selective control valves located at the couplers. The remote cylinders may be operated individually or simultaneously.

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

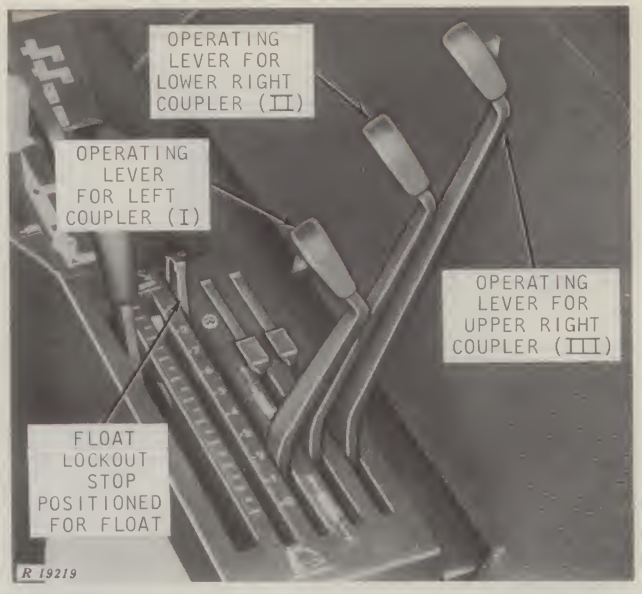
Before placing remote cylinder on transport bracket, fully retract the cylinder. Then rotate breakaway coupler levers to the straight rearward position to lock the cylinder in the retracted position.



Remote Cylinder on Transport Bracket

Using Remote Cylinder Operating Levers

The inner remote cylinder operating lever in the console controls the remote cylinder connected to the left-hand breakaway coupler (identified by numeral I). The next operating lever to the outside controls the remote cylinder connected to the lower right-hand breakaway coupler (numeral II). If the tractor



Remote Cylinder Operating Levers

is equipped to operate three remote cylinders, the outside lever controls the cylinder connected to the upper right-hand breakaway coupler (numeral III). Each lever has six operating positions.

Neutral. Move the lever to the approximate center position in the quadrant.

Slow Extend. Move lever slightly to the rear from neutral. The lever must be held until the desired adjustment is reached. In most applications, this will extend the remote cylinder and raise the implement.

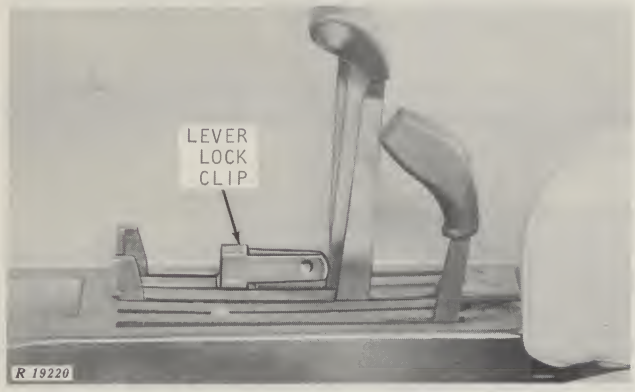
Fast Extend. Move lever all the way to the rear. The lever will remain in this position until the end of the piston stroke when it will automatically return to the neutral position.

Slow Retract. Move lever slightly forward from neutral. The lever must be held until the desired adjustment is reached. In most applications, this will retract the cylinder and lower the implement.

Fast Retract. Move lever forward to the first lock position (or to the stop when the float stop is in the float lockout position). The lever will remain in this position until the end of the piston stroke when it will automatically return to the neutral position.

Float. After raising the stop and placing it in the forward position, the lever may be moved all the way forward in the quadrant to the float position. The lever will lock in the float position until pulled rearward to a new position. When not needed, move the stop rearward to the float lockout position to prevent accidental use of float.

Lever Lock Clip



Lever Lock Clip

To keep the lever in the fast retract position, install a lever lock clip. To do so, squeeze the clip together slightly and insert it in the quadrant slot just behind the float lockout stop. Raise the stop slightly and slide the clip forward into position and push the stop down to lock the clip in place. To remove the clip, raise the float lockout stop first; then slide the clip rearward.

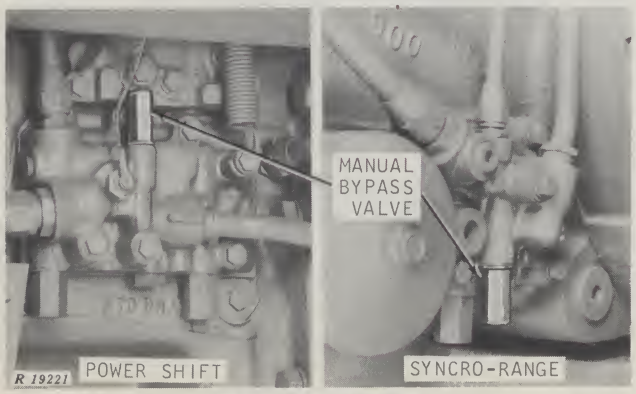
Adjusting Rate Of Operation

The maximum rate of operation for each remote cylinder can be increased or decreased by turning the metering valve arm on the selective control valve. This adjustment controls the maximum flow of oil through the selective control valve to the remote cylinder or hydraulic equipment.

Turn the metering valve arm for the breakaway coupler clockwise to increase the flow of oil or counterclockwise to decrease it.

⚠ CAUTION: Excessive operating speed may cause damage or injury. Full extension or retraction of the cylinder should require at least two seconds.

Manual Bypass Valve

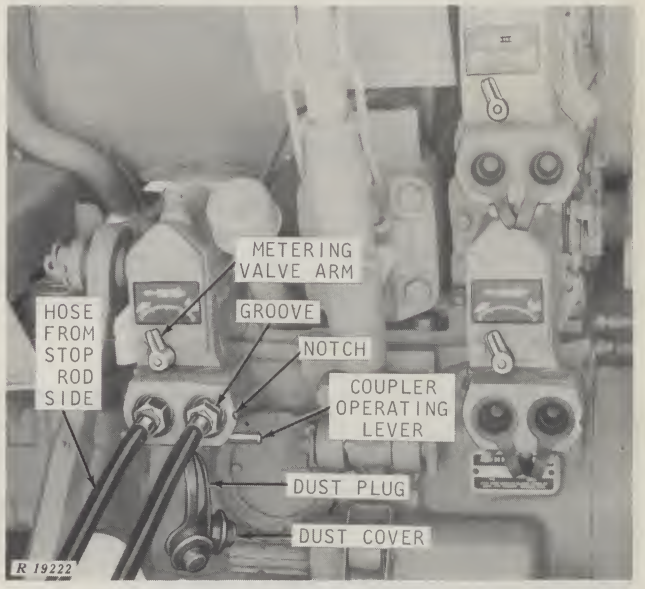


Manual Bypass Valve

To assist lowering of a single-acting cylinder, a manual bypass valve is 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 the cap on.

IMPORTANT: 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



Remote Cylinder Hoses Connected to Breakaway Coupler

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. 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 end with groove into the receptacle with notch and the hose from the stop rod side of cylinder into the other receptacle. (Moving the remote cylinder operating lever forward pressurizes the receptacle with notch.) Move the coupler operating levers until they are at a right angle to the hoses. This lifts the valves in the hose end and the receptacle off their seats and permits oil to flow.

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

Bleeding Remote Cylinder

If the hoses have been disconnected from a remote cylinder, connect the hose with grooved coupler end to the cylinder port with a notch. When connecting a cylinder with trapped air (a new cylinder, one that was out of service, or one that had the hoses disconnected), be sure to bleed the remote cylinder. With the hoses connected to the couplers, position the cylinder with the hose ends up and extend and retract the cylinder seven or eight times to remove the air. Check the transmission-hydraulic system oil level.

Attaching Remote Cylinder to Implement

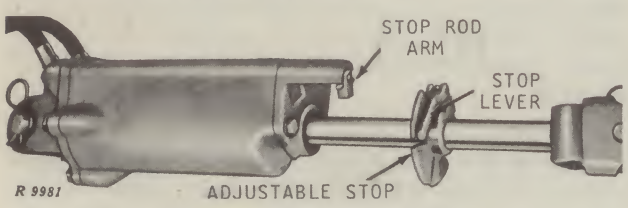
To install a remote hydraulic cylinder on most implements, remove the spring locking pins and pull the attaching pins. Set the cylinder in place and install the attaching pins and locking pins.

Many implements have a locking device for transporting 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.

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.

Mechanical Stop Remote Cylinder

The stop of a mechanical stop remote cylinder may be adjusted for a stroke of 1-1/8 inches to 8 inches. The stroke adjustment between 8 inches and 2 inches may be varied in 5/16-inch steps. To change the adjustment, pull out both spring-loaded stop rod pins, move the stop to the new position, and insert the pins.

IMPORTANT: Do not operate the remote cylinder unless BOTH stop rod pins are in place to lock both stop rods.

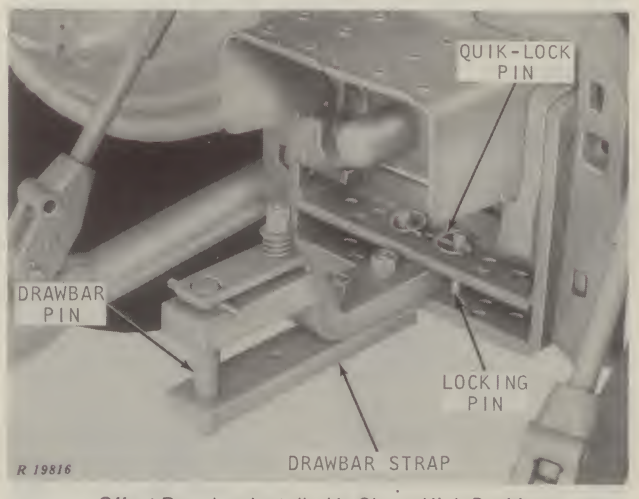
Removing Hoses From Breakaway Couplers

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 caps on the hose ends.

DRAWBAR ASSEMBLY

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

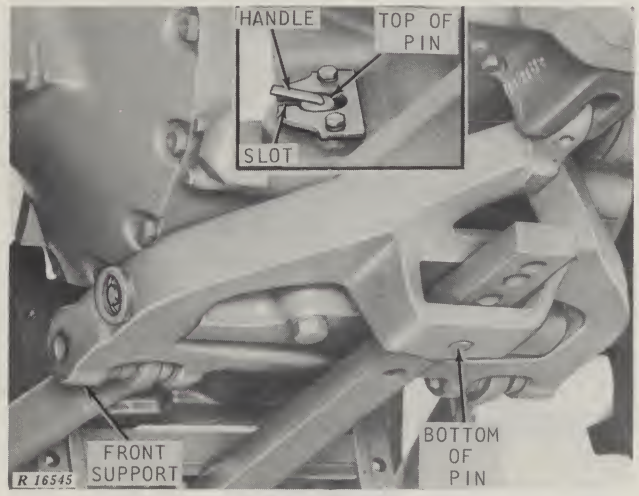


Offset Drawbar Installed in Short, High Position

NOTE: Before attaching a load to the drawbar, place the selector lever in the "ZERO" (lower) position (page 28). Keep the lever in this position after the implement is attached.

The drawbar 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.

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

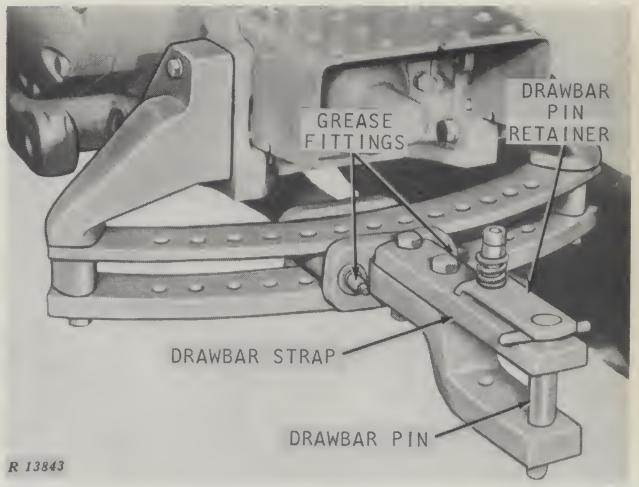


Drawbar Pivot Pin

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

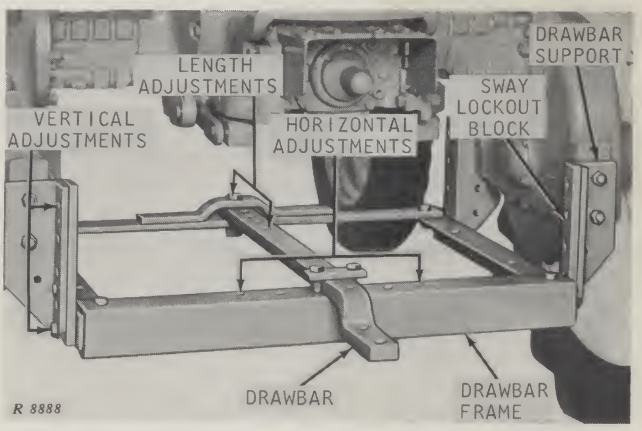
CAUTION: Never put your finger in the drawbar pivot pin hole.

The wide-swing drawbar assembly has a drawbar clevis consisting of a strap, pin, and a pin retainer. These parts are used when the towed implement does not have a clevis. The drawbar strap is bolted to the drawbar. When the drawbar offset is up, the pin retainer is bolted on top of the drawbar. When the offset is down, the pin retainer is bolted on top of the strap. Connect towed implements that also have a clevis to the drawbar, not the drawbar strap. Insert drawbar pin through the tractor clevis and only the top half of implement clevis.

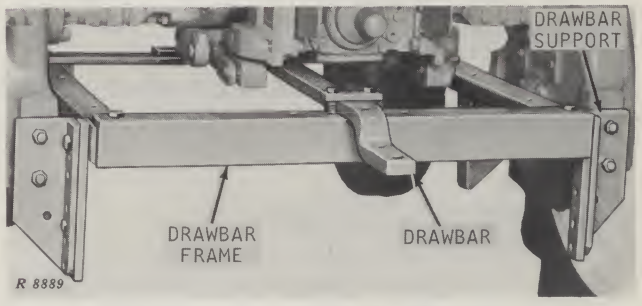


Wide-Swing Drawbar Assembly with Clevis

Hi-Crop Tractors



Hi-Crop Drawbar Frame in Low Position

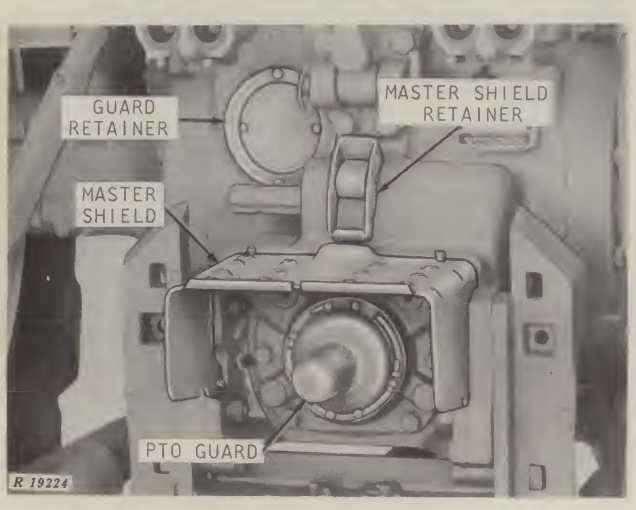


Hi-Crop Drawbar Frame in High Position

The Hi-Crop tractor drawbar may be adjusted verically, 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.

POWER TAKE-OFF



Rear Power Take-Off

The PTO connections conform to ASAE Standards and Recommended Practices. The 1000-rpm drive will transmit full engine horsepower at the standard operating speed. The 540-rpm drive is NOT intended to transmit full engine horsepower. The 540-rpm drive is for use with implements requiring less than 75 horsepower that do not have provision for operating with the 1000-rpm PTO. Operate PTO-driven machines requiring more than 75 horsepower with the 1000-rpm PTO to obtain longer tractor power take-off life and improved performance.

The power take-off may be 540 or 1000 rpm. A 6-spline stub shaft is installed on the rear dual speed PTO for 540-rpm operation. A 21-spline stub shaft converts the rear dual speed PTO to 1000 rpm.

The PTO shaft supplies continuous power as long as the engine is running and the PTO clutch lever is engaged.

Using PTO Clutch Lever

The power take-off shaft is controlled by the PTO clutch lever. Pushing the lever all the way forward engages the PTO clutch to operate the PTO.

Pulling the lever all the way back disengages the PTO clutch and engages the PTO brake.

When the PTO is not in use, move the lever rearward to the disengaged position.

PTO Clutch Lever Operating Positions

In very cold weather, if after starting the engine, the PTO shaft is slow in stopping when the PTO lever of a tractor with a Perma-Clutch is momentarily engaged and then placed in the brake position, depress the transmission clutch pedal to help draw oil from the PTO clutch.

CAUTION: The PTO brake is intended to stop only the PTO shaft, not the implement to which it is attached. When stopping PTO machines with large inertial loads, such as a combine or hammer mill, idle the engine to reduce PTO speed before disengaging the PTO clutch.

Removing PTO Guard

CAUTION: Always remove the guard from the guard retainer and install it on the power take-off when the PTO is not being used.

Remove the PTO guard only when the power take-off shaft is to be used.

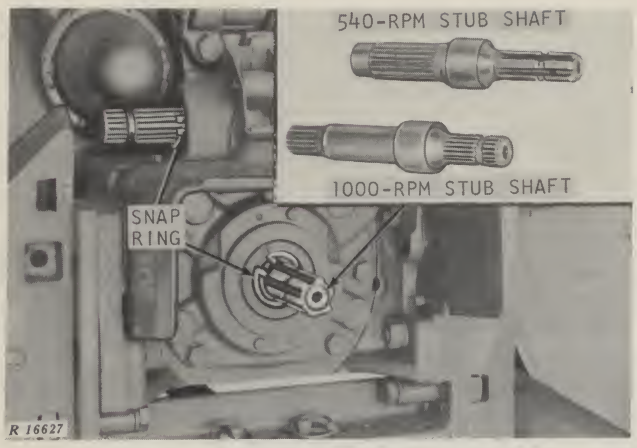
To remove the guard, twist it counterclockwise. The guard is stored by placing it on the guard retainer and twisting it clockwise to lock it in place.

Removing Master Shield

CAUTION: Remove the master shield only when necessary. Be sure that it is in place when the PTO guard is removed.

When attaching an implement, it may be necessary to remove the master shield at the rear of the tractor. To do so, push forward on the lower end of the master shield retainer and lift the master shield from the tractor.

Converting Rear PTO Speed



540 rpm Stub Shaft on Rear Power Take-Off

To change 540-1000 rpm power take-off to the other speed, first, clean the dirt from the stub shafts. Then remove the snap rings that retain both stub shafts. Pull the upper stub shaft from its storage hole in the transmission case.

Pull the stub shaft for the old speed from the rear power take-off and quickly install the stub shaft for the new speed to prevent loss of transmission oil. Install the snap ring. It may be necessary to rotate the collar in which the snap ring fits to align the rear splines.

Place the old speed stub shaft in the storage hole in the transmission case to prevent loss of oil from the storage hole and to store the stub shaft so that the power take-off may be converted to the original speed. Install the snap rings.

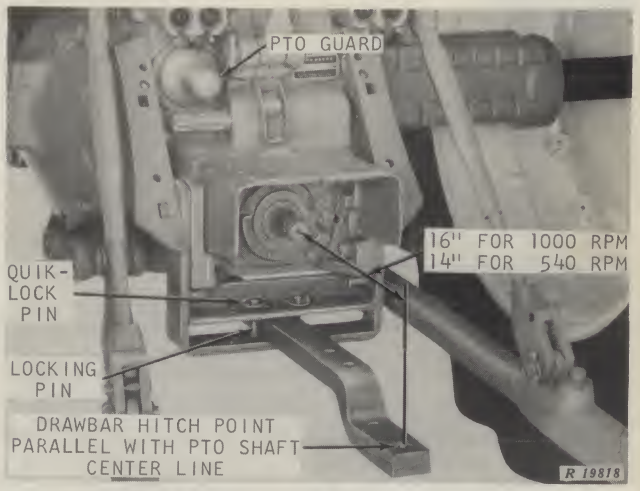
IMPORTANT: Before installing the stub shafts, be sure they are free from dirt or foreign matter.

Attaching PTO-Driven Implement

When the power take-off is to be used, lock the drawbar parallel to the PTO shaft with the drawbar offset DOWN. If present, remove the drawbar clevis. Position the locking pins as shown in the illustration.

If the power take-off is to be operated at 540 rpm, make lengthwise adjustment of the drawbar so that the hole in the drawbar end is 14 inches behind the end of the PTO shaft.

If the power take-off is to be operated at 1000 rpm, make lengthwise adjustment so that the hole in the end of the drawbar is 16 inches behind the end of the PTO shaft.



Drawbar Adjustment For PTO-Driven Implement

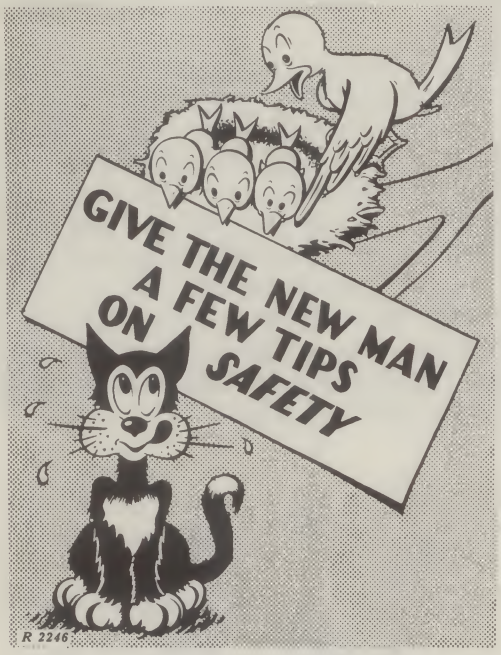
Possible damage to the universal joints on the drawn implement can be avoided if these simple adjustments are made before attaching the implement to the tractor.

With the engine stopped and the PTO clutch lever in the disengaged position, attach the PTO-driven implement and PTO SHIELDS to the tractor. With the engine running at a low speed, engage the PTO clutch by pushing the operating lever as far forward as it will go, starting the implement gradually. To obtain 540 or 1000 PTO rpm, the speed-hour meter pointer should be at the PTO mark when operating the implement under load. The hand throttle will usually be in the 2200-rpm load speed position. See the implement operator's manual when the implement is designed to operate at other PTO speeds.

⚠ CAUTION: Always make sure the tractor engine is stopped and the PTO clutch disengaged before attempting to clean out a PTO-driven machine or to adjust the implement hitch or power take-off hook-up.

Safety Rules

Power take-off guards, shields, and other safety features are built into the tractor whenever possible. However, investigation of thousands of accidents shows that careless use of machinery causes a high percentage of accidents. You can avoid many accidents by observing the rules for safety given here. Study these rules carefully and insist that they be followed by those working with you and for you.



All power equipment should be operated only by those who are responsible and delegated to do so.

Provide a first-aid kit for use in case of accident.

Reduce speed before turning quickly or applying brakes. Couple the brake pedals together when traveling at high speeds. Brake both wheels simultaneously when making an emergency stop. Always drive slowly over rough ground. Drive at speeds slow enough to insure your safety.

Towed loads that weigh more than twice the weight of the tractor should have brakes. If not, reduce speed and avoid inclines.

When pulling heavy towed loads at road speeds, use extreme caution and avoid hard applications of the tractor brakes at high speeds. When descending steep grades, select a sufficiently low gear to maintain control with minimum braking.

Always keep the tractor in gear when going down steep hills or grades.

Never tow the tractor at high speed.

Keep a firm grip on the steering wheel at all times when speed is increased.

The rate of tractor travel on hillsides and curves should always be reduced to minimize danger from tipping.

Avoid holes, ditches, or other irregularities, which may cause tractor to tip when operating on hillsides.

When driving out of a ditch, gully, or up a steep hillside, engage the clutch slowly. Be prepared to disengage the clutch promptly should the front wheels rise off the ground. Observe the same precautions if the rear wheels become mired in soft ground or drop in a hole. Back the tractor out of these situations.

Do not drive near the edge of a ditch or gully.

A protective four-post Roll-Gard is incorporated in each Sound-Gard Body. Your tractor may be equipped with a separate four-post Roll-Gard. Otherwise, a protective two-post Roll-Gard with seat belt is available for your tractor.

Under almost all operating conditions:

1. The use of a seat belt with the optional John Deere Roll-Gard is recommended.

2. Use of a seat belt without roll-over protective equipment is not recommended.

Only one person - the operator - should be permitted on the tractor when it is in operation. Never allow a person to ride on the drawbar.

When hitching drawn equipment to the drawbar, back the tractor past the clevis. Then move forward so that, in making the connection, the tractor will be moving away from the equipment.

When hitching a heavy towed load to the tractor, always hitch to the drawbar. When using a chain, be sure to take up the slack in the chain slowly.

Before dismounting, stop the tractor, place the transmission in park, lower implements to the ground, and shut off the engine.

Never attempt to start or to operate the tractor except from the operator's station.

Never operate the tractor engine in a closed building.

When transporting or driving the tractor on a road or highway at night or during the day, use accessory lights and devices for adequate warning to the operators of other vehicles. In this regard check local governmental regulations. Various safety lights and devices are available from your John Deere dealer. Make sure flashing warning lamps are in the upright position on Low Profile tractors.

In local areas where flashing lights are prohibited by local regulations, be sure that the flasher for warning lamps is disconnected.

When meeting a vehicle on the highway at night, dim the tractor headlights. Be sure the lights are adjusted so they will not blind the operator of an oncoming vehicle.

Since loose clothing might catch in moving parts, always keep sleeves, jackets, or other clothing relatively tight and belted.

Always make sure the engine is stopped, the PTO clutch disengaged, and the PTO shaft is stopped, before attempting to connect or adjust the implement hitch or power take-off hook-up or before attempting to clean out a PTO-driven implement.

Remove the PTO master shield only when necessary. Always install the PTO guard on the power take-off when the PTO is not being used. When the PTO is being used, be sure all PTO shields are in place on the tractor and the implement.

Do not oil, grease, adjust, or repair the tractor or implement while it is in motion or while the engine is running unless specifically recommended.

Poor maintenance or improper adjustment of the tractor or implement may result in a hazardous situation. Follow the recommended procedures and do not ignore items requiring maintenance or tightening.

Before making adjustments on engine or electrical system, disconnect the battery ground cable. If electrical system service is restricted to area behind the engine bulkhead, separate the connector in the 8-gauge red wire at the bulkhead rather than disconnecting the ground. Performing the above will prevent sparks which create a dangerous fire hazard and may cause damage or personal injury. It also prevents accidental starter operation.

Before using booster batteries, read instructions under additional batteries on page 6. To avoid sparks if a battery needs recharging, turn battery charger off before making connections or disconnections.

Add coolant to the radiator only when the engine is stopped or slowly idling. To avoid being scalded when the pressure-type filler cap is being removed, turn the cap slightly to the stop to relieve pressure before removing the cap.

Use precaution in handling ether starting fluid or any type of tractor fuel. Never refuel the tractor when the engine is hot or running. Do not smoke while using starting fluid, filling the fuel tank, or servicing the fuel system.

It is a good practice to have a fire extinguisher nearby. Be sure that the extinguisher is properly maintained and be familiar with its proper use.

Escaping hydraulic oil or diesel fuel under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

Do not attempt to disconnect or remove the brake accumulator without first relieving the oil pressure in the unit. See page 69 for instructions.

The accumulator unit is charged with dry nitrogen at a pressure of 500 pounds per square inch. Dry nitrogen must always be used to charge the unit.

Fuels and Lubricants

FUELS

The quality of fuel used is an important factor in obtaining dependable performance and satisfactory engine life. Suitable fuels must be clean, completely distilled, well-refined and non-corrosive to the fuel system parts. Be sure to use fuel of a known quality from a reputable supplier.

In some fuel conditions the interval between service on the fuel system may be increased by adding John Deere Diesel Fuel Conditioner to the fuel.

DIESEL FUEL SPECIFICATIONS

Either Grade No. 1-D or Grade No. 2-D fuel as defined by ASTM designation D 975 for diesel fuels may be used. The Grade No. 2-D fuel is heavier and will produce more work per gallon. However, Grade No. 1-D fuel will give better performance under certain conditions. Use the chart below to determine correct grade of fuel.

Type of Engine Service	Ambient Air Temperature	Fuel Grade No.
Light load, low speed, considerable idling.	Above 80° F. Below 80° F.	2-D 1-D
Intermediate and heavy load, high speed, minimum of idling.	Above 40°F. Below 40°F.	2-D 1-D
At altitudes above 5,000 feet	All	1-D

As further assurance of satisfactory operation, use fuel having less than 1.0 percent sulfur, preferably less than 0.5 percent.

For maximum filter life, sediment and water should not exceed 0.10 percent.

To maintain proper fuel delivery during cold weather operation, use number 1-D diesel fuel with a pour point at least 10° F. below lowest ambient air temperature.

The cetane number should be 40 minimum. Low atmospheric temperature as well as high altitude operation may require use of a fuel with a higher cetane number.

STORING FUEL

Prolonged storage of some diesel fuels may cause gum formation and clog the fuel filters.

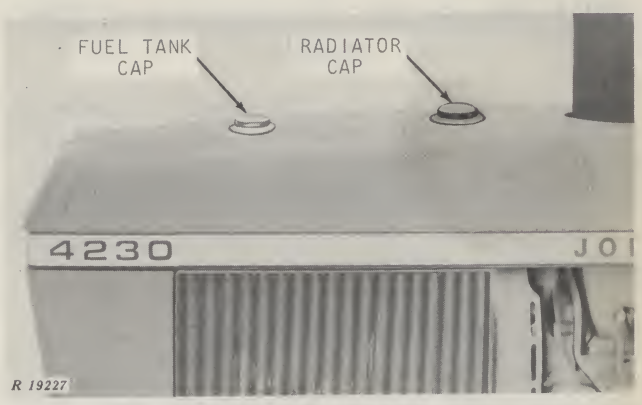
The importance of proper fuel storage cannot be stressed too highly. Many engine difficulties can be traced to dirty fuel and fuel that has been in storage too long. To keep the fuel system in its most efficient condition, keep all dirt, scale, water, and other foreign matter out of the fuel; and avoid storing fuel for a long period of time.

Fuel should be stored in a convenient place outside of buildings.

FILLING THE FUEL TANK

The fuel tank on your tractor is located at the front of the tractor under the hood. The fuel tank cap is located at the front left-hand side of the hood.

Fill the fuel tank at the end of each day's operation to prevent moisture from collecting and freezing in the fuel system. Capacity of the fuel tank is 37 U.S. gallons.



Location of Fuel Tank Cap

LUBRICANTS

Effective use of lubricating oils and greases is perhaps the most important step towards low upkeep cost, long tractor life, and satisfactory service. Use only lubricants specified in this section. Apply them at intervals and according to the instructions in the lubrication and periodic service section.

ENGINE LUBRICATING OILS

We recommend John Deere Torq-Gard or Torq-Gard Supreme Engine Oil for use in the engine crankcase. These oils are compounded specifically for use in John Deere engines and provide superior lubrication under all conditions. NEVER PUT ADDITIVES IN THE CRANKCASE. Torq-Gard and Torq-Gard Supreme are formulated to provide all the protection your engine needs. Additives could reduce this protection rather than help it.

If Torq-Gard or Torq-Gard Supreme is NOT USED, use an engine oil that conforms to one of the following specifications:

Single Viscosity Oils

API Service CD/SD
MIL-L-2104C
Series 3*

Multi-Viscosity Oils

API Service CC/SE, CC/SD, or SD
MIL-L-46152

** As further assurance of quality, the oil should also be identified as suitable for API service designation SD.*

Depending on the expected atmospheric temperature at start for the fill period, use oil of viscosity as shown in the following chart.

Air Temperature	John Deere Torq-Gard Oil	Other Oils	
		Single Viscosity Oil	Multi-Viscosity Oil
Above 32°F.	SAE 30	SAE 30	Not recommended.
−10°F. to 32°F.* *	SAE 10W-20	SAE10W	SAE 10W-30
Below −10°F.	SAE 5W-20	SAE 5W	SAE 5W-20

** * If ambient temperature at start is below 10°F., use an engine heater. SAE 5W-20 oil may also be used if required. This will insure optimum lubrication of the engine when starting, particularly if the engine is subjected to −10°F. or lower for several hours.*

Some increase in oil consumption may be expected when SAE 5W-20 or SAE 5W oils are used. Check oil level more frequently.

TRANSMISSION-HYDRAULIC SYSTEM OILS

Use only John Deere Type 303 Special-Purpose Oil or its equivalent in the transmission-hydraulic system. Other types of oil will not give satisfactory service, and may result in eventual damage. This special oil, available from your John Deere dealer, may be used in all weather conditions.

GEAR LUBRICANTS

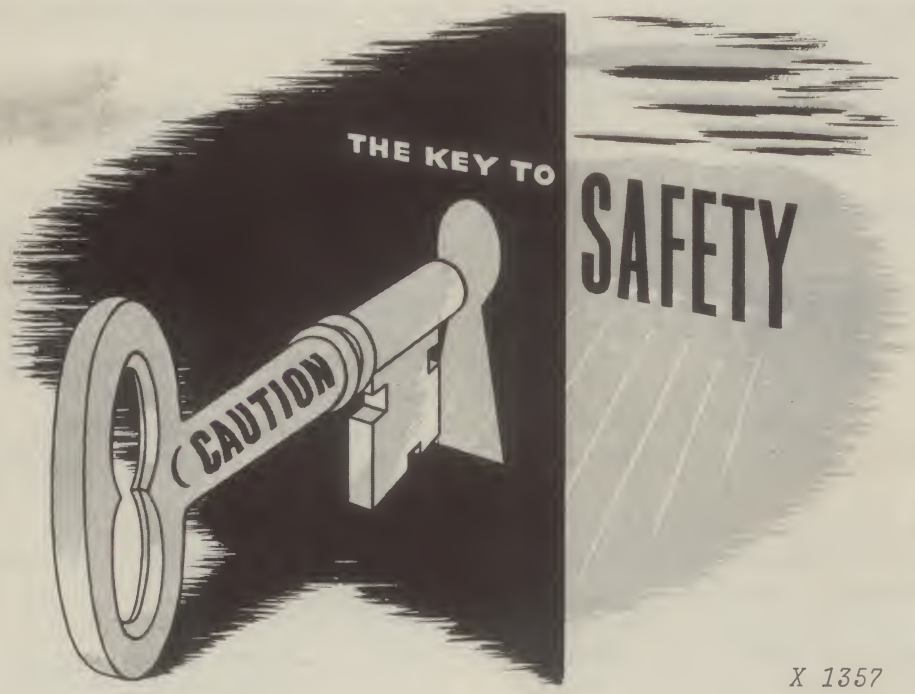
Use John Deere Gear Lubricant or an equivalent SCL Multipurpose-Type gear oil meeting API designation GL-4 in the Hi-Crop final drive housing.

GREASES

Use John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease for all grease fittings. Wheel bearing grease is recommended for front wheel bearings. Application of grease as instructed in the lubrication section will provide proper lubrication and will prevent bearing contamination.

STORING LUBRICANTS

Your tractor can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination.



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Lubrication and Periodic Service

The intervals at which the various working parts of your tractor should be checked, lubricated, serviced, or adjusted are based on hours of operation.

Hour Meter

Use the hour meter to determine when periodic services are required. The hour meter, which operates whenever the engine is running, shows the accumulated hours of operation.

BREAK-IN PERIOD

The break-in period is vitally important to the long life and satisfactory performance of your tractor. During this period, follow the special engine operating instructions on page 7.

Engine Crankcase

After the first 100 hours of service, change the engine oil and oil filter. Thereafter change the filter at the normal interval. If, during the first 100 hours only, it is necessary to add engine oil, use SAE 10W-20 Torq-Gard or the proper single viscosity engine oil meeting specification MIL-L-46152 or designated for API Service CC/SD.

Transmission-Hydraulic System

At the end of the first 100 hours, change the transmission-hydraulic system filter element. Then change the element at the normal service interval.

LUBRICATION AND SERVICE INTERVALS

The lubrication and service intervals for this tractor are based on operation under average conditions. When the tractor is operated under unusual conditions, such as excessive heat, cold, dust, frequent starts and stops, or with poor quality fuels or lubricants, the tractor should be serviced at MORE FREQUENT INTERVALS.

The chart which follows is a condensed list of the tractor components to be serviced at each interval and the service to be performed. Detailed instructions for performing each service are given on the pages which follow the chart. Each item in the chart is numbered, with the corresponding detailed procedure bearing the same number, such as AR-1 for the first item in the "As Required" service or 200-2 for the second item in the "200-Hour" service.

Perform the indicated services at the time intervals specified in the chart.

AS REQUIRED

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
AR-1	Air cleaner	Clean element	. . . . .	. . . . .
AR-2	Fuel filter	Replace	. . . . .	. . . . .
AR-3	Fuel injectors (diesel)	Clean	See your John Deere dealer for this service.	
AR-4	Injection pump (diesel)	Check timing	See your John Deere dealer for this service.	
AR-5	Compressor drive belt	Check adjustment	1-inch deflection, 25 lb. force	. . . . .

DAILY OR EVERY 10 HOURS

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
10-1	Engine crankcase	Check oil level	To upper mark	See page 45 for recommended engine oil.
10-2	Radiator	Check coolant level	1-1/2 inches above baffle in radiator	. . . . .
10-3	Fuel filter	Check sediment chamber	. . . . .	. . . . .
10-4	Wide-swing drawbar	Lubricate fittings	Several shots of grease	* John Deere Multi-Purpose Lubricant
10-5	Front axle	Lubricate fittings	Several shots of grease	* John Deere Multi-Purpose Lubricant
10-6	Hi-Crop rear axle	Lubricate fittings	Several shots of grease	* John Deere Multi-Purpose Lubricant
10-7	Front wheels and rear axle	Service daily when tractor has been operated in extremely wet or muddy conditions. See detailed instructions.		

* * EVERY 100 HOURS

100-1	Engine crankcase	Drain and fill	See page 53.	See page 45.

EVERY 200 HOURS

200-1	Engine crankcase	Replace filter	. . . . .	. . . . .
200-2	Fan belt	Check tension	See page 69.	. . . . .
200-3	Batteries	Check electrolyte level	To bottom of filler neck	. . . . .
200-4	Transmission	Replace filter element and wash breather in diesel fuel (Perma-Clutch only.)	. . . . .	. . . . .
		Check oil level	To top of "SAFE" range	* John Deere Type 303 Special-Purpose Oil
200-5	Brakes	Bleed brake system	. . . . .	. . . . .
200-6	Accumulator	Check operation	. . . . .	. . . . .
200-7	Tires	Check air pressure	See page 21.	. . . . .
200-8	3-point hitch	Lubricate fittings	3 or 4 shots of grease	* John Deere Multi-Purpose Lubricant
200-9	Hi-Crop final drive housing	Check oil level	To oil level plug hole	See page 55.
200-10	Front and rear wheels	Check tightness of nuts and bolts	See pages 16, 18 and 20.	. . . . .
200-11	Sound-Gard Body air filter	Clean	. . . . .	. . . . .

* *Or its equivalent.*

* * *Change the transmission-hydraulic system filter element (Item No. 200-4 or 600-7) at the end of the first 100 hours of operation. Then change the element at the normal service interval.*

EVERY 600 HOURS

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
600-1	Air intake hoses	Check hose connections	. . . . .	. . . . .
600-2	Fuel tank	Drain sump	. . . . .	. . . . .
600-3	Intake and exhaust valves	Check valve clearance	0.018-inch (Intake) 0.028-inch (Exhaust)	. . . . .
600-4	Engine	Check idle speeds	. . . . .	. . . . .
600-5	Transmission (Power Shift)	Replace filter elements and wash breather in fuel	. . . . .	. . . . .
600-6	Rear axle bearings	Lubricate	Grease appears at seals or 25 shots	* John Deere Multi-Purpose Lubricant

EVERY 1200 HOURS

1200-1	Front wheel bearings	Clean, repack, and adjust	. . . . .	Wheel bearing grease
1200-2	Transmission	Drain and fill; change filter element	See page 57	* John Deere Type 303 Special-Purpose Oil
1200-3	Hi-Crop final drive	Drain and fill	2-1/4 U.S. quarts	* Above 32°F., SAE 90 John Deere Gear Lubricant; Below 32°F., SAE 80 John Deere Gear Lubricant
1200-4	Hydraulic pump	Clean pump filter	See your John Deere dealer for this service.	

ANNUAL SERVICE

A-1	Cooling system	Drain, flush, and fill	24 U.S. quarts	. . . . .
A-2	Air cleaner	Replace primary and safety elements	. . . . .	. . . . .

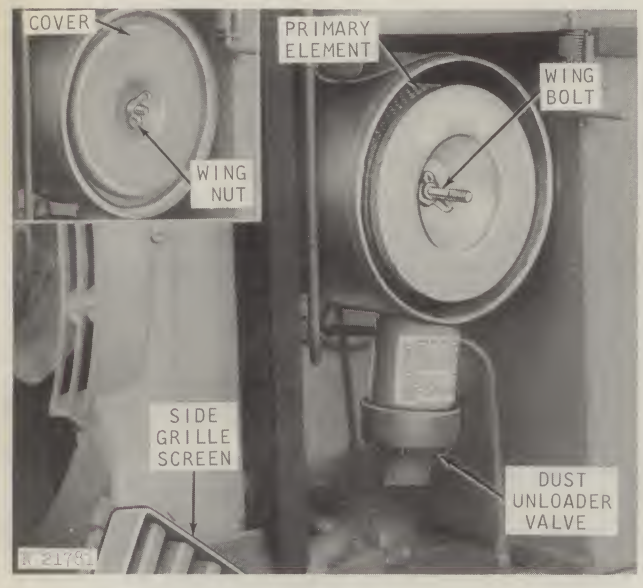
* *Or its equivalent.*

* * *Add approximately 4-1/2 gallons if equipped with Power Front-Wheel Drive.*

DETAILED PERIODIC SERVICES

AS REQUIRED

AR-1. Cleaning Dry Air Cleaner Filter



Air Cleaner

Whenever the air cleaner indicator light (page 2) glows, clean the filter elements at the next refueling or regular daily or 10 hour service period. In dirty operating conditions, it may be necessary to service the element in the field.

Accelerating the engine too rapidly may cause the indicator light to glow prematurely.

NOTE: Indicator light will not signal correctly if a filter element is ruptured or if the element is not properly sealed in the cleaner housing. Loss of power or excessive smoke may indicate a restricted element. If this happens, inspect the elements and check the indicator light for proper operation.

Remove the cover. Inspect the dust unloader valve for cracks, clogging, or fatigue. Clean or replace the valve as necessary. Remove the wing bolt and primary filter element. Wipe clean the inside of the cleaner body. If the primary element is dry and dusty, clean the element as instructed with compressed air or water. If the element is oily or sooty, wash the element in filter element cleaner solution.

Both filter elements and the dust unloader valve must be in place before operating the engine.

Safety Element

Safety Element

The safety element catches particles that would pass through a ruptured primary filter element. Remove the safety element only when it is to be replaced. Never attempt to clean a safety element. Install a new safety element after one year of service or sooner if it causes excessive restriction. This is indicated by short intervals between cleaning of the primary filter element (one not clogged by soot). The dirt that plugs a safety element passes through a ruptured primary element or around a defective seal. When replacing a safety element, remove the retaining nut and element. Install the new element, making sure it is sealed at the gasket and at the retaining nut.

Temporary Field Service

When the element must be serviced in the field, install a spare element or pat the side of the element gently near the end with the palm of the hand as a temporary service. Rotate the element when patting so the entire circumference is covered. Thoroughly clean the element after returning to the service area. Do not tap the element against a tire or hard surface as this may dent or rupture the element.

Patting Element

Air-Cleaning Element

Cleaning Element with Compressed Air

Use the John Deere AR62377 dry element cleaning gun with compressed air and insert the cleaning gun as illustrated. Hold the air nozzle near the inside of the perforated sheet metal retainer and squeeze the handle. Air is forced through the element from the inside to the outside. Move the gun up and down the pleats cleaning as much of the loose dirt from the element as will come free.

IMPORTANT: Do not blow air from the outside to the inside or attempt to dust off the outside portion of the element with the air nozzle.

Pat the element lightly with the palm of the hand as instructed under temporary field service. The patting should be done carefully. Dirt will be loosened that was not previously blown out. Repeat the cleaning gun process. After cleaning inspect the element.

Cleaning Element with Water

Clean as much dirt from the element as possible with compressed air. Attach a garden hose to the receptacle portion of the cleaning gun using a rubber washer between the gun and hose (maximum water pressure of 40 psi). Flush the dirt from the element forcing the water from the inside of the element to the outside as shown below. Allow the element to dry completely and inspect the element before installing it.

Washing Element

Rinsing Element

Cleaning Sooty or Oily Elements

Blow dust from the element with compressed air or flush with clean water. Soak the element for at least 15 minutes in a solution of warm water (no hotter than your hand can stand) and John Deere Filter Element Cleaner (Part No. R36757) or its equivalent. Gently agitate element to flush out dirt. Rinse it THOROUGHLY from the inside to the outside using the cleaning gun or a free-running hose without nozzle (maximum pressure of 40 psi). Before reusing, allow the element to dry. This usually requires 24 to 72 hours. Do not oven-dry or use drying agents. Temperatures above 180°F. will shorten element service life. Protect it from freezing while drying. Using compressed air may rupture a wet element. Inspect the element.

IMPORTANT: Never wash elements in gasoline, fuel oil, or similar solvents. Do not oil elements.

Inspecting Element

After cleaning the element, inspect it for damage. Place a bright light inside the filter and discard any element that shows the slightest hole or rupture. If it is to be stored for later use, place it in a plastic bag and store in an element shipping container to protect against dust and damage.

Replace the filter element after one year of service or sooner when interval between cleanings becomes short, indicating that the element is not responding to cleaning. If filter gasket is damaged or missing, replace the element. If wing screw gasket is damaged or missing, replace the gasket.

Install and secure the element in place with wing screw and gasket washer. Be sure gasket washer is in good condition and is against the element. Install the cover. Replace side grille screen. Never operate the engine without the filter elements or unloader valve.

AR-2. Replacing Fuel Filter

Replace as required, see page 61.

AR-3. Cleaning Fuel Injectors

Whenever faulty or dirty injectors are indicated by abnormal engine operation, see your John Deere dealer.

AR-4. Checking Injection Pump Timing

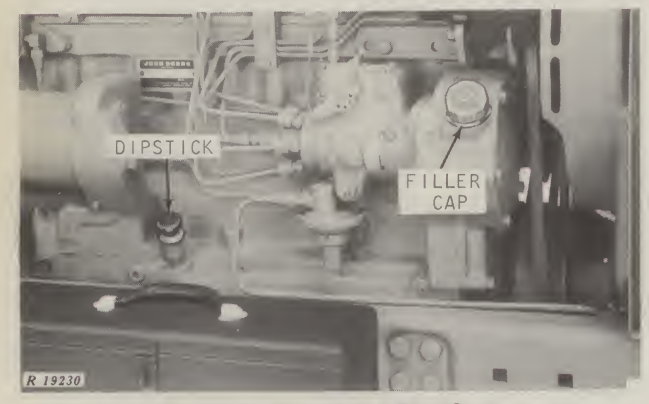
Whenever faulty injection pump timing or operation is indicated by abnormal engine operation, see your John Deere dealer.

AR-5. Checking Compressor Drive Belt

Adjust as required, see page 72.

DAILY OR 10-HOUR SERVICE

10-1. Checking Engine Crankcase Oil Level



Crankcase Dipstick and Filler Cap

With the tractor on level ground and the engine stopped for 10 minutes or more, loosen the dipstick and remove it. Obtain the engine oil level on the dipstick, with the dipstick seated evenly. If the oil level is down to the lower marks on the dipstick, add sufficient John Deere Torq-Gard Engine oil or its equivalent of the proper viscosity to bring the level to the upper marks.

10-2. Checking Radiator Coolant Level

With the tractor on level ground, remove the radiator filler cap (next to the muffler) and check the coolant level. If the coolant level is lower than 1-1/2 inches above the baffle in the radiator top tank, add clean soft water or antifreeze as necessary to maintain protection of the cooling system.

CAUTION: Remove the radiator filler cap only when the coolant temperature is below the boiling point. The gauge pointer should be to the left of the vertical position. Then loosen the cap slightly to the stop to relieve pressure before removing the cap completely.

Check the pressurized cooling system for loose connections or leaks after adding coolant. If pressure is not maintained, loss of coolant and overheating will result. Tighten the filler cap.

10-3. Checking Fuel Filter

Check filter for sediment or water as instructed on page 60.

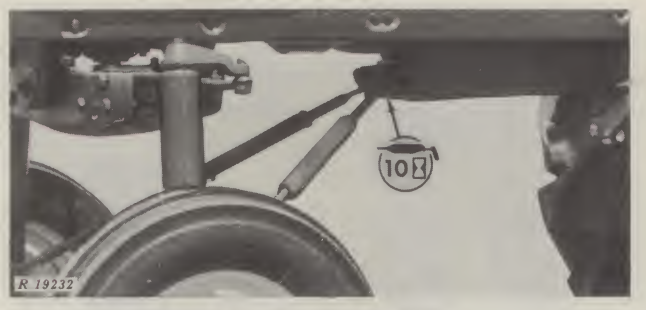
10-4. Lubricating Wide-Swing Drawbar

If the tractor has a wide-swing drawbar, apply several shots of John Deere Multi-Purpose Lubricant or its equivalent to the drawbar rollers.

10-5. Lubricating Front Axle

If tractor has a wide front axle, apply several shots of John Deere Multi-Purpose Lubricant or its equivalent to tie rods, the pivot pins, and the steering spindles (10 fittings). On Hi-Crop tractors with radius rods, also apply several shots of grease to the radius rod pivot grease fitting. If the tractor has a Roll-O-Matic front axle, apply John Deere Multi-Purpose Lubricant or its equivalent at the two fittings until grease appears at the felt seals. On Low-Profile tractors, apply several shots of grease to the pivot pins and steering spindles.

Wide Front Axle Grease Fittings
(Also Applies to Power Front-Wheel Drive)



Radius Rod Pivot Grease Fitting

Roll-O-Matic Grease Fittings

Front Wheel Grease Fitting

10-6. Lubricating Hi-Crop Rear Axle

On Hi-Crop tractors, apply several shots of John Deere Multi-Purpose Lubricant or its equivalent to the grease fittings on the end of the rear axle. See illustration on page 55.

10-7. Lubricating Front Wheels and Rear Axles

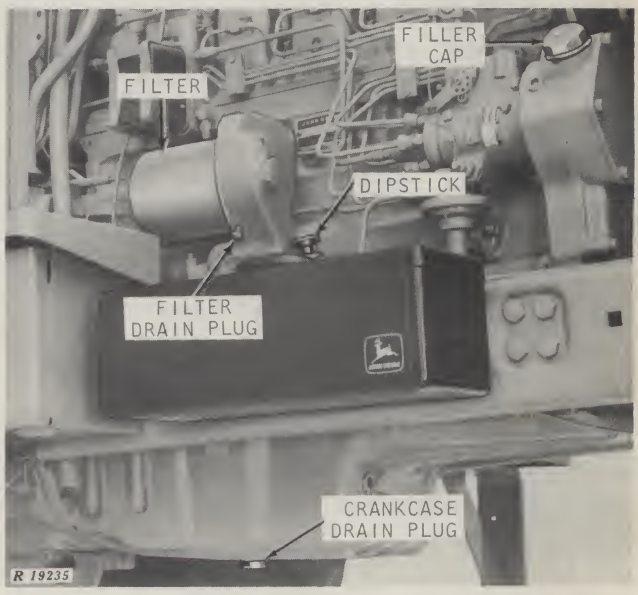
When the tractor is being operated in extremely wet and muddy conditions, grease each front wheel (except Power Front Wheel Drive) and rear axle (except Hi-Crop) (page 57) daily or every 10 hours. To do so, remove the pipe plugs, install fittings, and apply several shots of John Deere Multi-Purpose Lubricant or its equivalent. CONTINUE lubricating the front wheels at this interval until the bearings can be cleaned and packed with wheel bearing grease.

100-HOUR SERVICE

NOTE: On new tractors, replace the transmission-hydraulic system filter element after the first 100 hours of operation. Then change the element at the normal service interval.

Perform the regular daily or 10-hour service in addition to the following.

100-1. Draining and Filling Crankcase



Oil Filter and Crankcase Drain Plug

With the engine warm, remove the crankcase drain plug and drain the oil from the crankcase.

Install the drain plugs and add new John Deere Torq-Gard Engine Oil or its equivalent of the proper viscosity (page 45). Check for leaks around the crankcase drain plug. Retighten if necessary. The oil level on the dipstick ten minutes after stopping should be at the upper marks. The capacity is 15 U.S. quarts.

Keep a record of all oil and filter changes on the oil and filter change stickers that come with the filters.

SAFETY FIRST

THE COMPLETE OBSERVANCE of one simple rule would prevent many thousand serious injuries each year. THAT RULE IS: "NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST A MACHINE WHILE IT IS IN MOTION."

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200-HOUR SERVICE

Perform the regular daily or 10-hour service, and the 100-hour service in addition to the following.

200-1. Changing Crankcase Oil Filter

While draining the crankcase oil (item number 100-1), change the crankcase oil filter. Remove the filter drain plug to drain the filter element. Remove the filter element by turning it counterclockwise. Clean the filter mounting pad. If necessary, replace the sealing ring. Apply a thin film of oil to the sealing ring and screw the new element in place by hand until it is tight. Engine crankcase oil capacity with filter change is 17 U.S. quarts.

IMPORTANT: The element does not have a bypass valve. Replace only with a genuine John Deere filter element from your John Deere dealer.

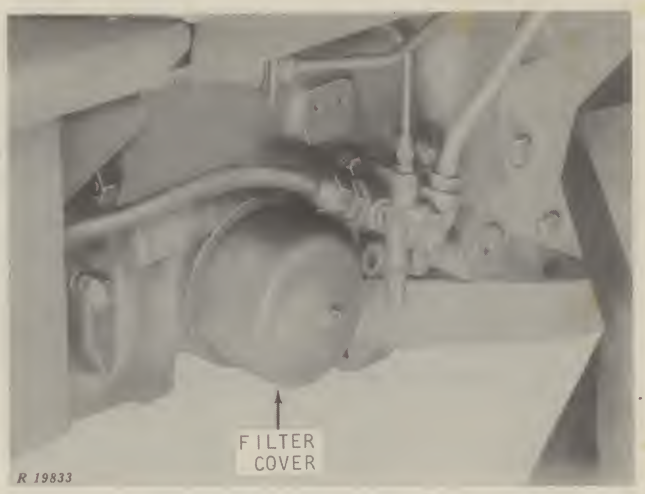
200-2. Checking Fan Belt Tension

Check the belt tension as instructed on page 66.

200-3. Servicing the Batteries

Clean the batteries and check the electrolyte level of each battery cell. See page 65.

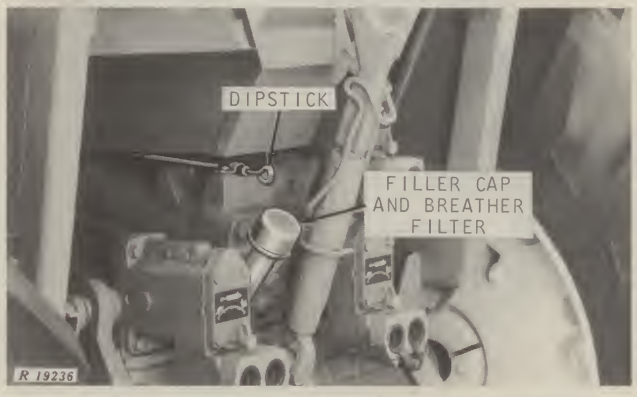
200-4. Replacing Transmission-Hydraulic System Oil Filter Element and Cleaning Breather Filter (Perma-Clutch Only). Checking Oil Level (All Tractors)



Transmission-Hydraulic System Filter Cover

On a Tractor with a Perma-Clutch, stop the engine and remove the transmission-hydraulic system oil filter cover. Pull out the oil filter element and install a new filter element. Check the condition of the packing between the element and the retainer. Replace the filter cover gasket. Install and tighten the filter cover to 45 ft-lbs torque.

Remove the transmission-hydraulic system filler cap and wash the breather filter inside the cap in diesel fuel.



Transmission-Hydraulic System Filler Cap and Dipstick

With the tractor on level ground, run the engine for a minute to fill the filter. Stop the engine and check the transmission-hydraulic system oil level with the dipstick. If the oil level is down to the "ADD" mark at the bottom of the "SAFE" range on the dipstick, remove the filler cap and add John Deere Type 303 Special-Purpose Oil or its equivalent to bring the oil level up to the top of the "SAFE" range.

200-5. Bleeding Power Brakes

Bleed the power brakes as explained on page 69.

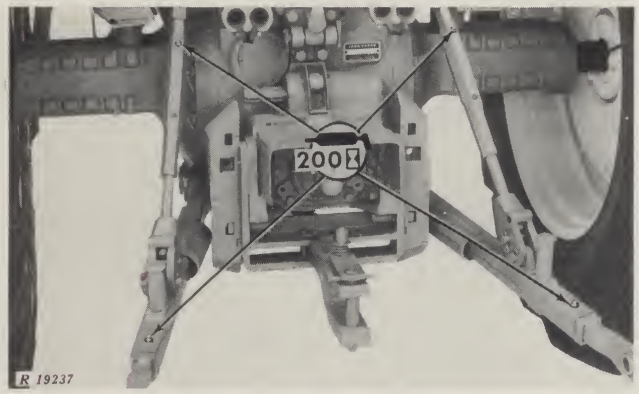
200-6. Checking Accumulator

After bleeding the brakes, check the accumulator as instructed on page 69.

200-7. Checking Tire Inflation Pressure

Check the tires for damage and correct inflation pressures. See pages 21 and 70.

200-8. Lubricating 3-Point Hitch

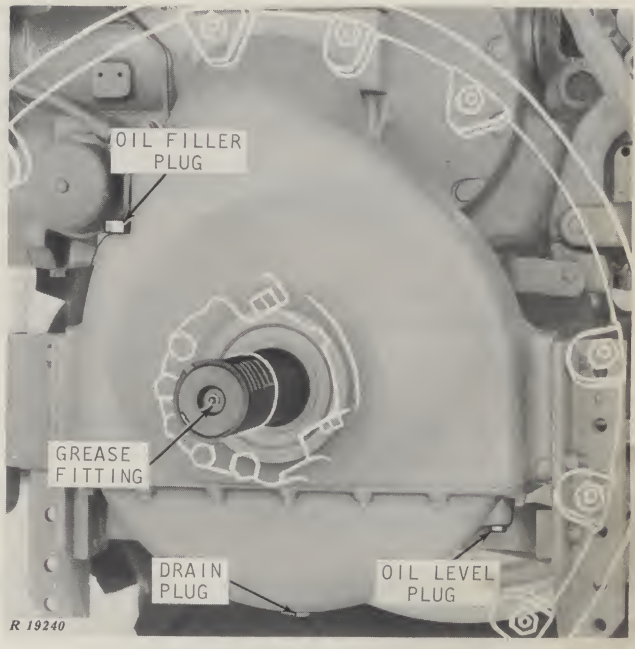


3-Point Hitch Grease Fittings

Grease the 3-point hitch by applying 3 or 4 shots of John Deere Multi-Purpose Lubricant or its equivalent at each fitting.

200-9. Checking Final Drive Housing Oil Level (Hi-Crop Tractors)

Remove the oil level plug from each final drive housing and check the oil level. If low, add lubricant at the filler plug until oil starts to come out of the level plug hole. With temperatures above 32°F., use John Deere SAE 90 Gear Lubricant or its equivalent. At temperatures below 32°F., use John Deere SAE 80 Lubricant or equivalent.

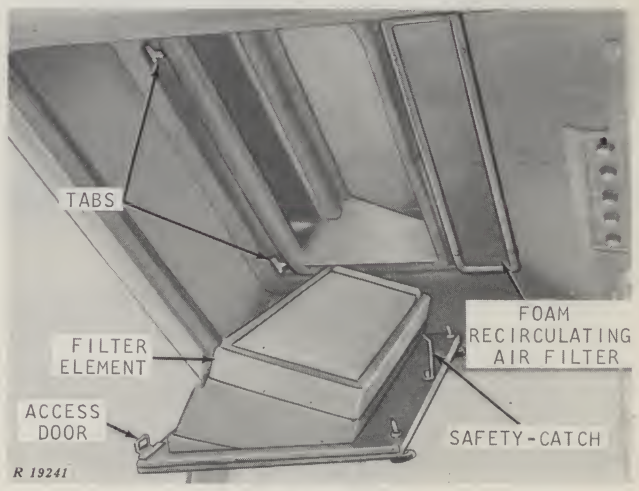


Hi-Crop Rear Axle Grease Fitting and Final Drive Housing Oil Plugs

200-10. Checking Tightness of Front and Rear Wheels

Every 200 hours or whenever required, check the tightness of the front wheel bolts (page 16) and rear wheel nuts and bolts (pages 18 and 20). Never operate a tractor with a loose wheel.

200-11. Cleaning Air Filter Element of Sound-Gard Body



Air Filter Element

If your tractor has a Sound-Gard body, loosen the knobs to open the filter access door. Depress the

Access Door Safety Catch

safety catch at the front of the door and remove the door and filter. Clean the element as instructed for the engine air cleaner (Item AR-1, page 50).

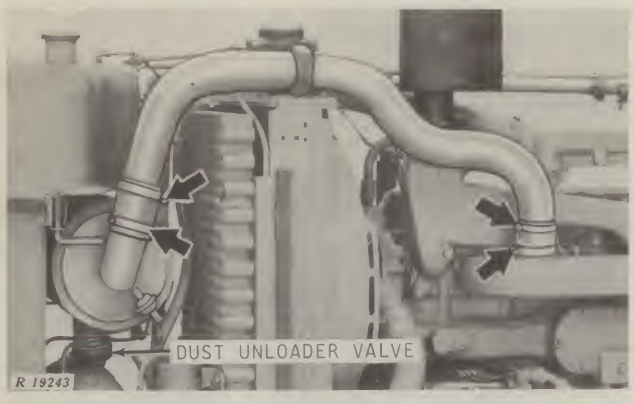
Check the foam filter for recirculated air. If it needs cleaning, loosen the retaining screws to remove the filter frame. The foam filter may be washed or cleaned with compressed air.

A clogged air intake screen under each side of the roof will also reduce the air flow.

600-HOUR SERVICE

Perform the regular daily or 10-hour service, the 100-hour service, and the 200-hour service in addition to the following.

600-1. Checking Air Cleaner Connections



Air Intake Pipe Connections

Remove the hood (page 59) and check the clamps on the hoses which connect the air cleaner and engine. Tighten the hose connections where necessary. This will help to prevent dirt or sediment from entering through loose connections. Inspect the dust unloader valve for cracks, clogging, or deterioration.

600-2. Draining Fuel Tank Sump

See page 60.

600-3. Checking Valve Clearance

See page 64.

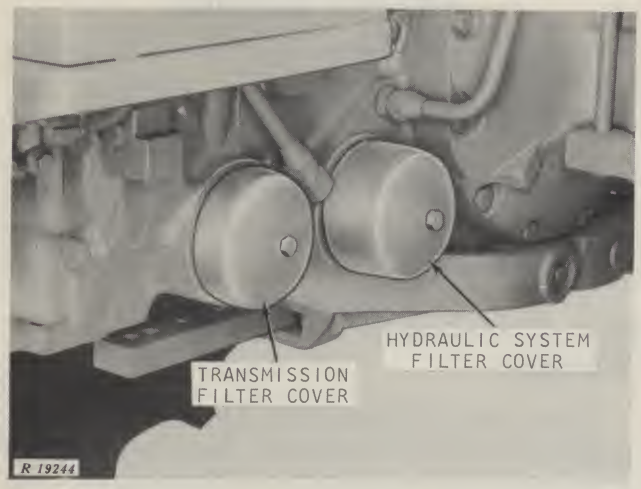
600-4. Checking Engine Idle Speeds

With the engine at operating temperature, use the speed-hour meter to check the engine speeds:

Throttle Positions	Load Speed	No Load Idle Speed
Rearward	. . . . .	800 rpm
Forward	2200 rpm	2400 rpm

If the idle speeds need to be adjusted or if there is doubt as to the accuracy of the speed-hour meter, see your John Deere dealer.

600-5. Replacing Transmission-Hydraulic System Oil Filter Elements and Cleaning Breather Filter (Power Shift Only)



Transmission-Hydraulic System Filter Covers

If your tractor has a Power Shift transmission, stop the engine and remove both transmission-hydraulic system oil filter covers. Pull the elements out and install new filter elements. Check the condition of the packing between the element and the retainer. Replace the filter cover gasket. Install and tighten the filter covers to 45 ft-lbs torque.

Remove the transmission-hydraulic system filler cap (page 54) and wash the breather filter inside the cap in diesel fuel.

600-6. Lubricating Rear Axle Bearings

Grease the rear axle bearings by removing the pipe plug on each end of the axle housing, installing a grease fitting, and applying John Deere Multi-Purpose Lubricant or its equivalent at each fitting until grease appears at the axle seals. (If rear wheel weights obscure rear axle seal, apply the maximum of 25 shots of grease.)

Rear Axle Grease Plug

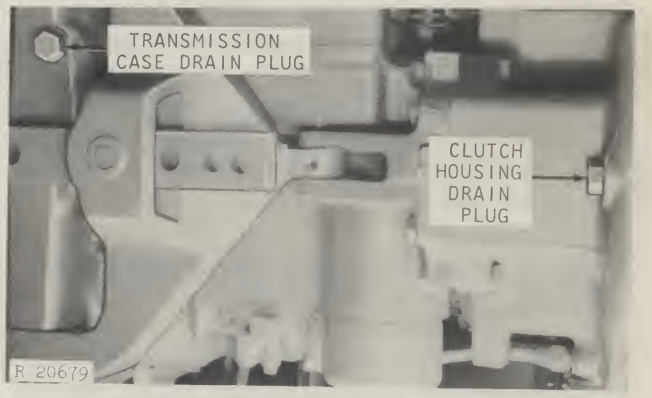
1200-HOUR SERVICE

Perform the regular daily or 10-hour service, the 100-hour service, the 200-hour service, and the 600-hour service in addition to the following.

1200-1. Lubricating Front Wheel Bearings
(All Except Power Front-Wheel Drive)

Clean and pack the front wheel bearings and oil seal. Adjust the front wheel bearings. See page 70.

1200.2. Draining and Filling Transmission-Hydraulic System



Transmission-Hydraulic System Drain Plugs

With the engine warm, remove both transmission-hydraulic system drain plugs and drain the oil (Power Shift tractors have one drain plug). Replace the drain plugs.

Add new John Deere Type 303 Special-Purpose Oil or its equivalent at the filler cap. Bring the oil level on the dipstick to the top of the "SAFE" range. Transmission-hydraulic system capacity when drained and the filter changed is 15-1/2 U.S. gallons for Power Shift tractors or 16 U.S. gallons for Quad-Range, Syncro-Range, and Creeper tractors.

Power Front-Wheel Drive Drain Plug

On Power-Front Wheel Drive tractors, position the drain plug on the wheel at the bottom, clean the area around the plug, protect the tire, and drain each wheel housing. Position the drain hole near the top and put 2 quarts of John Deere Type 303 Special-Purpose Oil or its equivalent in each front wheel. Install the drain plugs. With transmission oil level at the top of the "SAFE" range, add 2 extra gallons to transmission. Operate the front drive for 2 or 3 hours and ADD oil to the transmission to bring it to the proper level. The front wheels hold approximately 4-1/2 gallons (2-1/4 gallons each).

1200-3. Draining and Filling Final Drive Housing (Hi-Crop Tractors)

Remove the drain plug from each final drive housing and drain the oil (see illustration on page 55). Replace the drain plugs. Remove the oil level plugs and filler plugs. Fill each housing until the oil is up to the level hole. At temperatures above 32°F., use John Deere SAE 90 Gear Lubricant or its equivalent. At temperatures below 32°F., the lubricant viscosity should be SAE 80. Capacity of each housing is 2-1/4 U.S. quarts.

1200-4. Cleaning Hydraulic Pump Valve Filter

See your dealer.

ANNUAL SERVICE

Once each year, perform the following services. If the tractor is to be stored, use the "Tractor Storage" instructions on page 73.

A-1. Cleaning the Cooling System

Drain, clean, flush, and refill the cooling system as instructed on page 62.

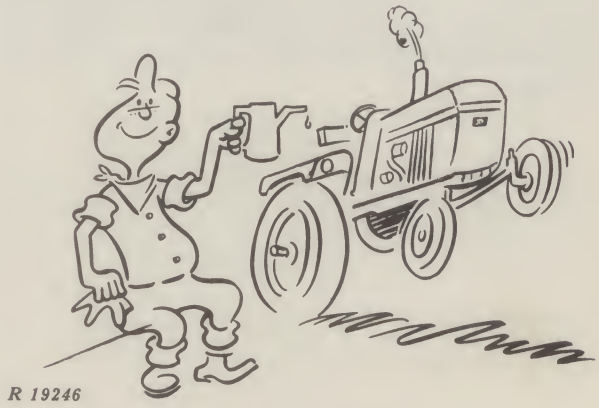
A-2. Replacing Air Cleaner Filter Elements

The air cleaner primary filter element and the safety element should be replaced once each year or more often if the interval between cleanings becomes short. See Item AR-1 on page 50.

DEALER SERVICES

Your John Deere dealer offers complete tractor service. His factory-trained personnel have access to accurate, detailed service information. Some of the dealer services are listed below.

(1) Engine tune-up.
(2) Injection pump, injector, and diesel fuel system service.
(3) Carburetor and gasoline fuel system service.
(4) Ignition system service.
(5) Electrical system checks.
(6) PTO clutch adjustment.
(7) Hydraulic system service.
(8) Cooling system service.
(9) Parts service.

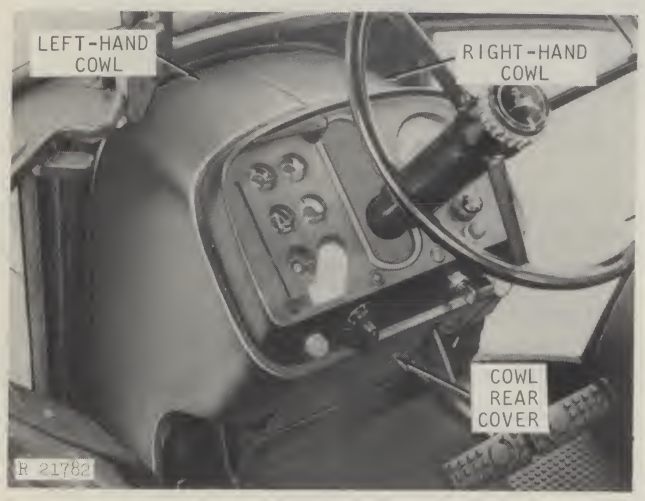


The Tractor Will Respond to Proper Lubrication.

Service

The instructions on the following pages will help you keep your tractor performing efficiently and economically. For additional service and genuine parts, see your John Deere dealer.

REMOVING COWL



Cowl

To remove either cowl, first remove the cowl rear cover. Then remove either or both the left-hand or the right-hand cowl.

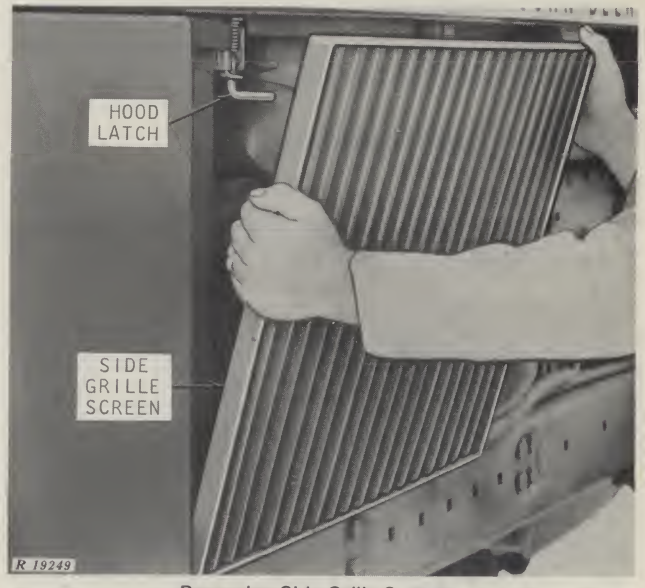
REMOVING HOOD

To remove the hood, first remove the side shields by pulling downward until the pins clear the hood. Then pull outward and remove the side shields. Remove the hood retaining nuts.

Pull out slightly on the top edge of each side grille screen, lift the screens from the tractor, and allow them to hang by the springs. Turn the hood latch handles out. Remove the radiator and fuel tank caps. If desired, remove the muffler. Lift hood off and install the radiator and fuel tank caps to prevent entry of foreign material.

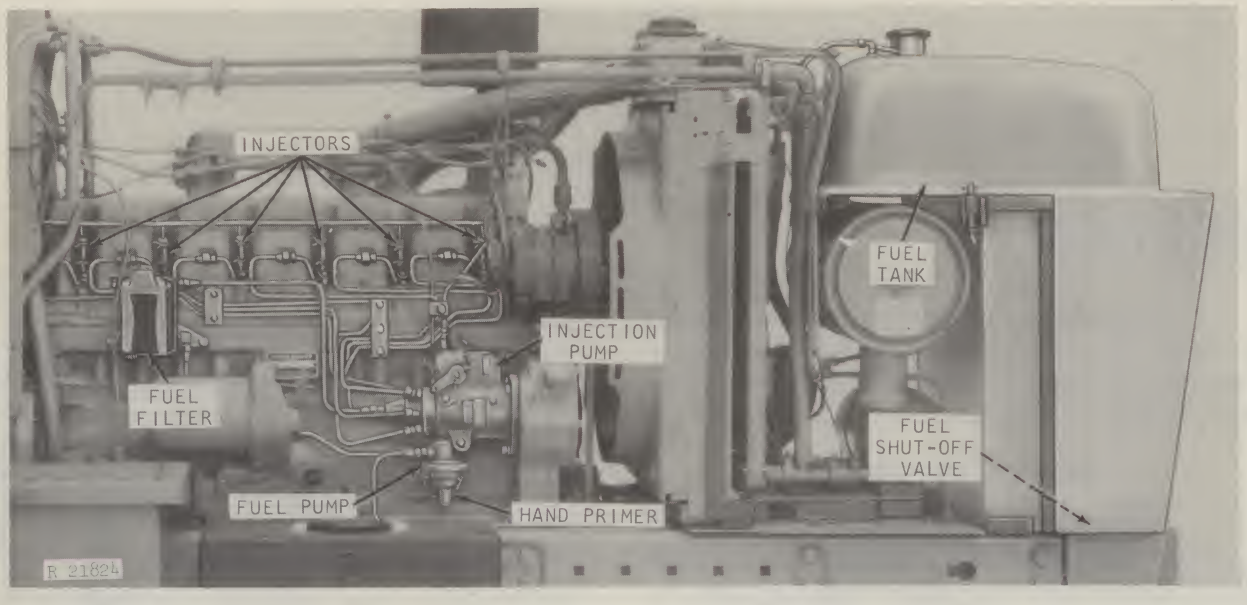
When washing or cleaning the tractor, do not allow water or steam to enter the air cleaner intake opening. To prevent damage to injection pump, do not run the engine while washing.

Removing Side Shield



Removing Side Grille Screen

DIESEL FUEL SYSTEM



Diesel Fuel System

Description

The diesel fuel system consists of the fuel tank, fuel pump, fuel filter, injection pump, fuel injectors, and the connecting pipes. Fuel tank capacity is 37 U.S. gallons.

Modification or alteration of the injection pump, the injection pump timing, or the fuel injectors in ways not recommended by the manufacturer will terminate the warranty obligation to the purchaser. See your copy of the John Deere Warranty for this tractor.

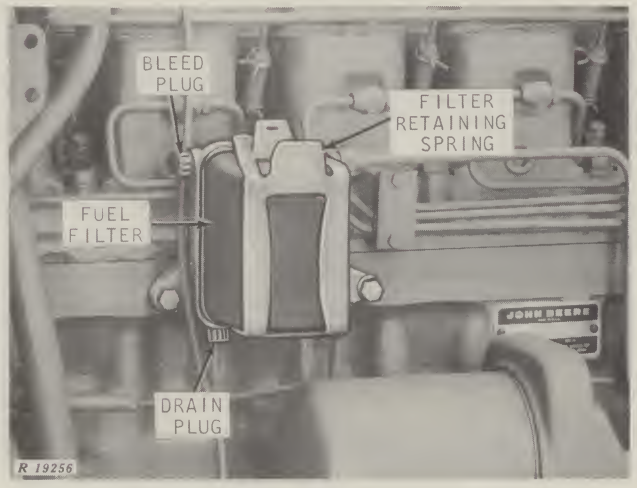
Inspection and Cleaning

Proper servicing of the fuel system is important. Visually inspect the fuel filter daily or after every ten hours of operation. If there is water or an excess of foreign matter at the bottom of the filter, loosen the filter drain plug and drain the foreign matter or water from the filter. Bleed the fuel filter.

If water was present in the filter, drain all the water from the fuel tank to prevent the water from plugging the filter. A stand pipe on the fuel shut-off valve provides a sump at the bottom of the fuel tank to trap the water. To drain the sump, disconnect the fuel pipe at the shut-off valve, and remove valve.

Improper fuel storage may necessitate excessive cleaning of the fuel system. After correcting the cause of contaminated fuel, drain the fuel tank sump and the fuel filter. Add John Deere Diesel Fuel Conditioner to the fuel and have your dealer check the fuel system.

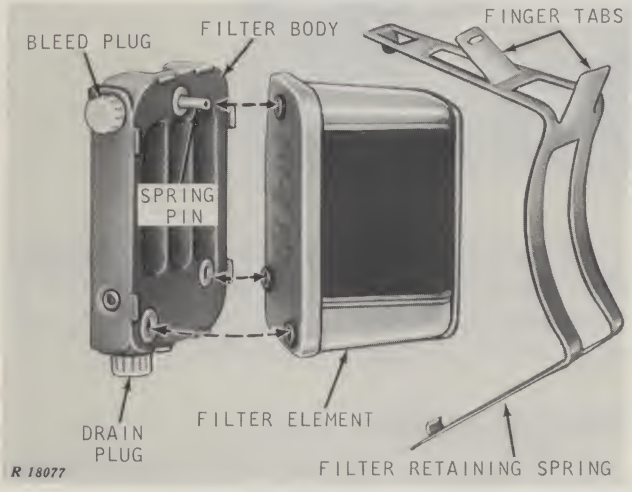
Fuel Tank Shut-Off Valve



Fuel Filter

Replacing Filter Element

The fuel filter prevents dirty fuel from reaching the injection pump and injectors. A combination first and second stage filter element is contained in the sediment bowl as a complete assembly. The filter element assembly will require occasional replacement to maintain adequate flow of fuel to the injection pump for full tractor horsepower. The frequency of this service will be determined by the cleanliness of available fuel and the care used in fuel storage.



Fuel Filter

To release the filter retaining spring, press inward on the outside finger tab and squeeze the tabs together to disengage the top hook of the spring. Pull filter off and push the new filter over the spring pin. Hook the bottom of the filter retaining spring first and the top hook last.

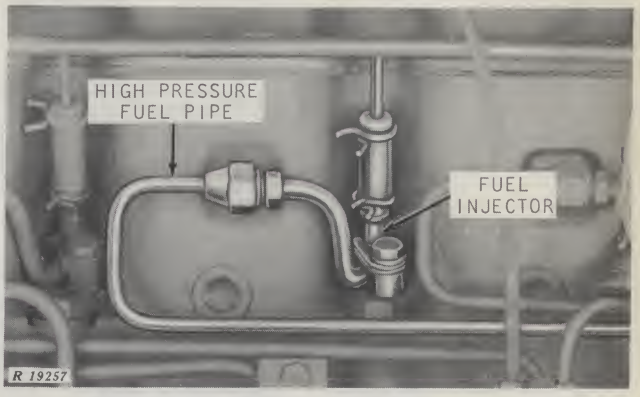
IMPORTANT: Any dirt lodged in the spring pin groove or at the end of the spring pin by cleaning efforts will be washed into the injection system and may result in severe damage to the injection pump or nozzles.

Fuel Injectors

Occasionally fuel injectors may require removal for inspection or service. The frequency of this service will be determined by the type of operation, fuel cleanliness, and fuel quality. Whenever faulty or dirty injectors are indicated by abnormal engine operation, see your John Deere dealer.

IMPORTANT: Do not attempt to remove and disassemble injectors as special tools are required.

Bleeding Fuel System



Fuel Injector and High-Pressure Fuel Pipe

When the fuel filter is removed or the tractor runs out of fuel, bleed the air from the fuel filter.

To do so, loosen the filter bleed plug. Pump the primer lever on the fuel pump until most of the air bubble in the filter is gone and fuel flows from the bleed plug. Tighten the bleed plug and leave the primer lever in the down position.

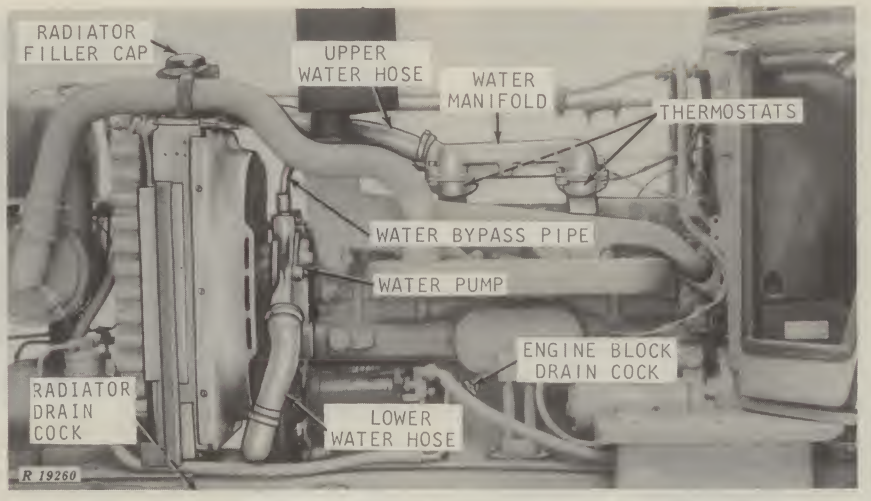
NOTE: If the primer does not pump fuel and no resistance is felt at the upper portion of the lever stroke, turn the engine with the starter to change the fuel pump cam position.

CAUTION: Escaping diesel fuel under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

If the engine misses after bleeding the filter and will not smooth out, bleed the entire fuel system. First, bleed the filter. Then loosen the high pressure fuel pipe on three or more injectors using two wrenches. With the hand throttle half way forward and the engine stop knob pushed all the way in, turn the engine with the starter until fuel without foam flows from the loose connections (the engine may start running). Tighten the connections using two wrenches. Finish bleeding the other injectors by running the engine until it is running smoothly.

COOLING SYSTEM



Cooling System

Description

The cooling system consists of the radiator, radiator filler cap, water manifold, thermostats, water bypass pipe, upper and lower water hoses, in-block coolant heater, and coolant passages within the cylinder head and block.

Because the cooling system is pressurized, all of its components must be tight and in good condition before the system can operate properly. Unless pressure is maintained, overheating and loss of coolant will result.

R 19261

CAUTION: Remove the radiator filler cap only when the coolant temperature is below the boiling point (the gauge pointer should be to the left of the vertical position.) Then loosen the cap slightly to the stop to relieve pressure before removing the cap completely.

The pressure valve in the radiator cap will release when the cooling system pressure is from 6-1/4 to 7-1/2 pounds. Cooling system capacity is 24 U.S. quarts. Add 2 U.S. quarts for a heater.

Cleaning Cooling System

For efficient operation, the cooling system should be drained, flushed, and filled once each year.

To perform this service, drain the system by opening the drains on the engine block and radiator. Turn Sound-Gard Body heater on and leave it on until finished cleaning and refilling the system. Close the radiator and the engine block drains and fill the system.

Run the engine until it reaches operating temperature to stir up possible rust or sediment. Stop the engine and drain the coolant from the system before the rust or sediment settles.

Close the drains. Fill the cooling system with a solution composed of John Deere radiator cleaner or its equivalent, and water. Follow the instructions with the cleaner.

After cleaning the cooling system, fill it with water. To FLUSH the system, install the filler cap and run the engine until it reaches operating temperature. Then stop the engine and drain out this flushing water.

Close the drains and fill the cooling system to 1-1/2 inches above the baffle in the radiator top tank. Use clean, soft water and, for protection from freezing, ethylene glycol-type antifreeze or, during non-freezing weather, John Deere T19566T Summer Coolant Conditioner or its equivalent. Recheck coolant level after starting the engine.

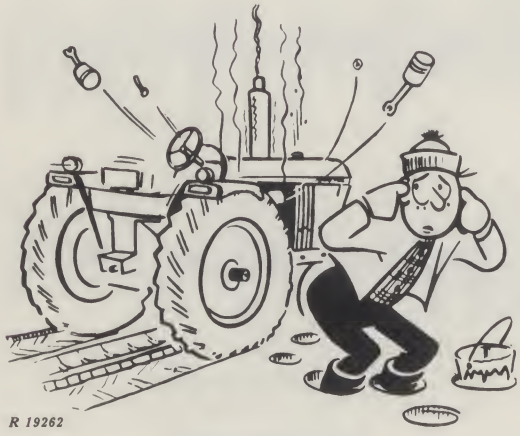
Well water or tap water usually contains impurities which corrode, cause rusting, or clog a cooling system and reduce cooling system efficiency. In some

areas of the country, these impurities will soon damage a cooling system. See your John Deere dealer for complete cooling system care.

Removing Thermostat

Drain the cooling system and remove the hood (page 59). Disconnect the upper water hose from the water manifold. Then remove the manifold-retaining cap screws and lift the manifold with the water bypass pipe off the tractor. Remove the thermostat at either end.

With the thermostats in place, install the water manifold and water bypass pipe. Connect the upper water hose, close the drains, and fill the system.

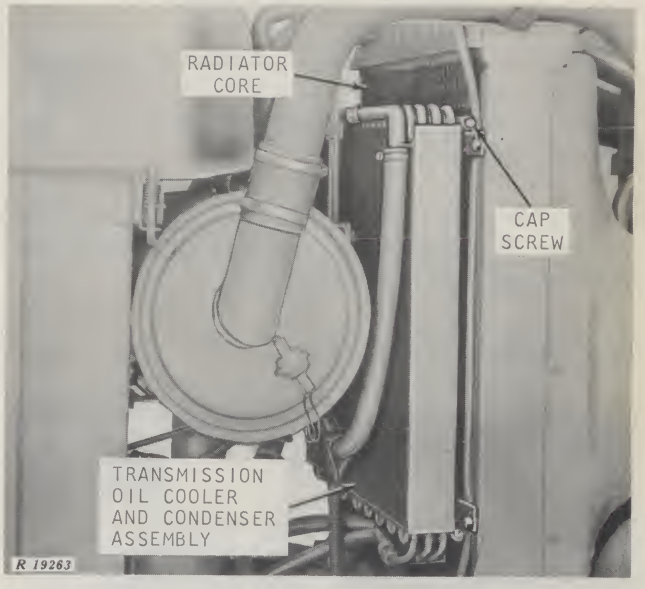

R 19262

IMPORTANT: Never pour hot water into a cold engine or cold water into a hot engine. You may crack the head or the cylinder block. Do not operate the tractor without water for even a few minutes.

Cleaning Side Grille Screens, Radiator Core, and Oil Cooler

Remove the hood. Examine and remove all chaff and dirt from the air passages in the radiator core, transmission oil cooler core, and if so equipped, the air conditioner condenser core. Straighten bent fins.

To clean the radiator core behind the oil cooler or oil cooler-condenser, remove the cap screw and push the cooler-condenser in to expose the radiator core. When finished cleaning one-half of the radiator, pull the cooler-condenser back into the normal position and install the cap screw. Repeat this procedure on the opposite side of the tractor for the other half of the radiator. Clean the grille screens. Install the hood.



Radiator Core and Oil Cooler-Condenser Core

Preparing for Cold Weather

Prior to cold weather, be sure the cooling system has sufficient antifreeze to provide protection from freezing.

Antifreeze

Use only a reliable brand of ethylene glycol (permanent type) antifreeze which contains a rust inhibitor but does not contain a stop-leak additive.

After adding the antifreeze solution, run the engine until it reaches operating temperature to allow the thermostats to open. This will make sure that the solution is circulated throughout the entire cooling system.

Draining

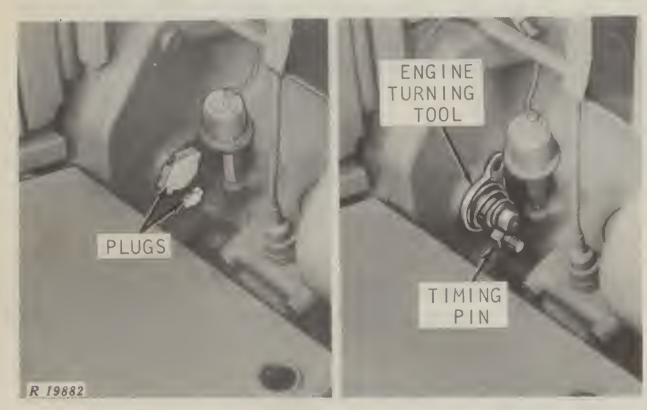
If the cooling system is drained to prevent freezing, drain both the engine block and the radiator. When refilling the system, use clean soft water and John Deere Summer Coolant Conditioner. Be sure to recheck the coolant level after starting the engine. If the Sound-Gard Body has a heater, the heater does not drain completely. Use antifreeze to prevent damage to heater core from freezing.

VALVE CLEARANCE

The valve clearance should be checked and adjusted, if necessary, after every 600 hours. The engine should be stopped while checking clearance but may be either hot or cold.

Clean the area around the valve cover and the injectors. Remove the hood (page 59), crankcase breather pipe, and the valve cover.

Turning Diesel Engine



Engine Turning Tool

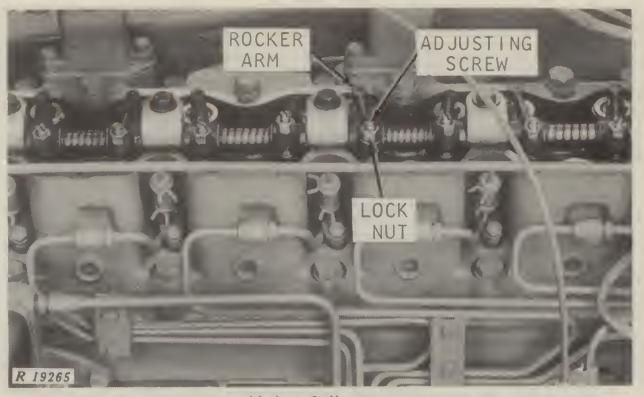
Remove the plugs from the holes for the engine turning tool and the engine timing pin (JDE-81-1 turning tool and T20090 Pin are available from your dealer). Use a 5/8-inch socket and a 3/8-inch drive ratchet on the turning tool to rotate the engine. Push inward and push downward on the ratchet to turn the engine in the running direction. Press in on the timing pin while turning the engine until the pin enters the TDC timing hole in the flywheel.

Adjusting Valves

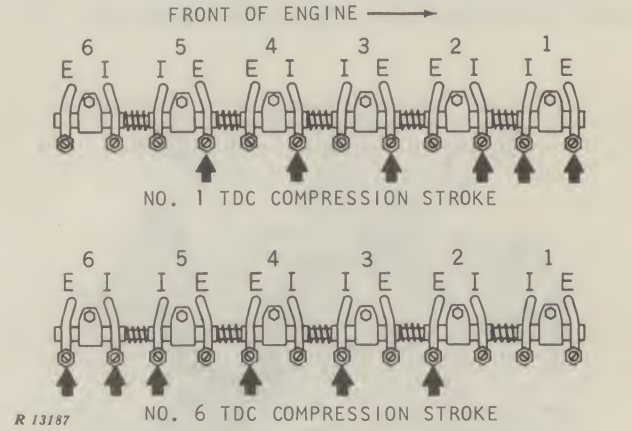
All the valves can be adjusted accurately by turning the crankshaft to only two positions - TDC with No. 1 cylinder on the compression stroke and TDC with No. 6 cylinder on the compression stroke. It does not matter which valves are adjusted first.

To determine which cylinder is at TDC on the compression stroke, examine the exhaust valves of Nos. 2 and 5 cylinders. If the exhaust valve of No. 2 cylinder is partially open, No. 1 cylinder is at TDC on the compression stroke. If the exhaust valve of No. 5 cylinder is partially open, No. 6 cylinder is at TDC on the compression stroke.

With No. 1 cylinder at TDC on the compression stroke, adjust the following valve clearances: intake valve on cylinders 1, 2, and 4 and the exhaust valve on cylinders 1, 3, and 5. These are the first, second, third, fifth, seventh, and ninth valves from the front of the engine. See the chart for the correct valve clearance.



Valve Adjustment



Valve Adjusting Sequence

VALVE CLEARANCE

Intake Valves - 0.018 in.
Exhaust Valves - 0.028 in.

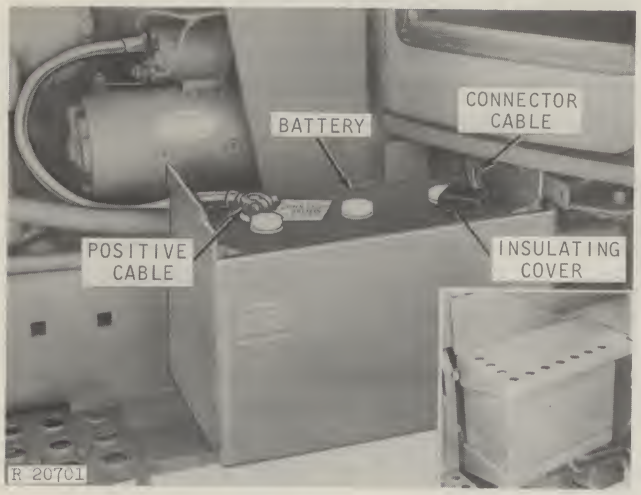
With No. 6 cylinder at TDC on the compression stroke, adjust the following valve clearances: intake valve on cylinders 3, 5, and 6 and the exhaust valves on cylinders 2, 4, and 6. These are the first, second, third, fifth, seventh, and ninth valves from the rear of the engine.

To adjust valve clearance, loosen the lock nut and turn the adjusting screw in or out. Recheck the clearance after tightening the lock nuts.

After all valve clearances are correct, remove the turning tool and timing pin. Install the plugs in the holes. (If tractor has Syncro-Range or Quad-Range transmission, be sure the O-rings on the plugs are in good condition to prevent oil leakage.) Install the valve cover, crankcase breather pipe and the hood.

ELECTRICAL SYSTEM

Batteries



Diesel Battery

Two 6-volt batteries (one on each side of tractor) are connected in series to furnish 12 volts for the electrical system. To gain access to a battery, release the latches located at front and rear of battery box cover. Pull the cover forward to remove it.

When replacing the battery, use the John Deere battery shown in the following chart or its equivalent. Both diesel batteries must have the same rating.

Volts	John Deere Part No.	BCI Group	Cold Cranking Amps 0°F	Cold Cranking Amps -20°F	Reserve Capacity (Minutes at 25 amps)
6	AR47455	5D	800	640	376

The John Deere batteries in your tractor are warranted for the specific length of time that is punched on the battery warranty tag. Do not remove or destroy the warranty tag that is on a battery post.

Dangers Connected with Batteries

Keep all sparks or open flames away from the batteries as the gas from the electrolyte is highly flammable. To avoid sparks when using booster batteries, hook them up according to the instructions on page 6. If a battery needs recharging, avoid sparks by turning off the charger before making connections or disconnections. Severe damage or burns will be caused if some parts of the electrical system are grounded or short circuited. WHEN SERVICING THE ELECTRICAL SYSTEM, DISCONNECT THE BATTERY GROUND CABLE.

Cleaning Batteries

Keep the batteries clean by wiping them off with a damp cloth at the end of every 200 hours of operation or whenever dirt appears excessive.

If corrosion is present around the terminal connections, remove it and wash the terminals with an ammonia solution or a solution consisting of 1/4 pound of baking soda added to one quart of water. Be sure the vent plugs are tight to prevent cleaning solution from entering the cells.

After cleaning, flush the outside of the battery, the battery compartment, and surrounding areas of the tractor with clear water. Examine the vent holes in each battery cap to make sure they are open.

Checking Specific Gravity

Use a battery hydrometer to check the specific gravity of the electrolyte in each battery cell. Hold the hydrometer vertical and take the reading. Correct the reading by adding four gravity points (0.004) for every ten degrees the electrolyte temperature is above 80°F. or subtracting four gravity points for every ten degrees below 80°F. A fully charged battery will have a corrected specific gravity of 1.260. Charge the battery if the reading is below 1.215.

Checking Electrolyte Level

Check the level of the electrolyte (acid and water solution) in the batteries at least every 200 hours of operation. Fill the battery cells to the bottom of the filler neck. Use distilled water. If distilled water is not available, use any clean water that is fit to drink and does not have a high mineral content.

NOTE: Since water and electrolyte will not mix immediately, do not add water in freezing weather unless the engine is to be run long enough (2 or 3 hours) to assure a thorough mixing of water and electrolyte.

Cold Weather Battery Service

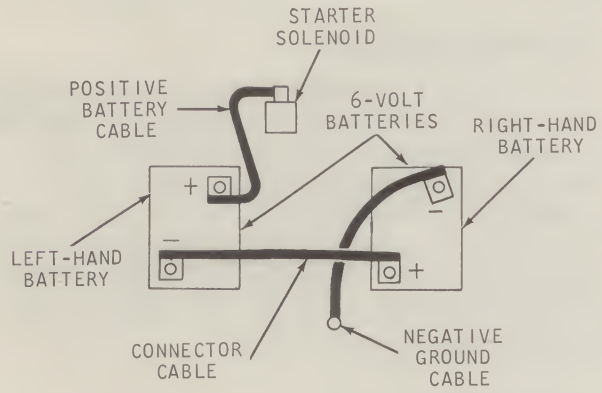
During cold weather, it is particularly important to keep the electrolyte in the batteries at the proper level, and to keep the batteries fully charged. Otherwise the batteries are apt to freeze. Freezing weather will have little damaging effect on a fully charged, properly filled battery.

Removing and Installing Batteries

Disconnect the battery ground cable first. Ground cable for diesel tractor is on right-hand battery. If removing the left-hand battery from a diesel tractor, then disconnect the connector cable from the negative terminal. Disconnect the positive battery cable last. Remove the battery holddown clamp. On a 4-post Roll-Gard or Sound-Gard Body, loosen nut at rear of battery box and pull outward and forward on the battery box side panel. Lift the battery off the tractor.

When installing the battery, overtightening of the clamp may damage the battery. On a diesel tractor without a 4-post Roll-Gard or Sound-Gard Body, the positive battery post should be to the front.

Connecting Batteries



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Battery Connections

Before connecting the battery, be sure all the electric switches and accessories are turned off. Connect the positive battery cable first. If installing the left-hand diesel battery, connect the connector cable to the negative post and install the insulating cover (see illustration on page 68) before connecting the ground cable. Before connecting the battery ground cable, momentarily touch it against the negative post. With all switches and accessories off, no sparks should occur. Connect the ground cable.

Tighten the clamps securely. Coat the terminals and connectors with vaseline mixed with baking soda to retard corrosion.

Storing Batteries

If the tractor is to be stored for more than 30 days, remove the batteries. With the electrolyte level at the bottom of the split ring, charge the battery before storing it. After every 30 days battery is in storage, bring it back up to full charge. To minimize self discharge, store the battery in as cool a place as possible so long as the electrolyte does not freeze. Electrolyte at 1.220 specific gravity (corrected to 80°F.) will freeze at −31°F. At 1.260, the electrolyte will freeze at −75°F.

Alternator

The alternator located at the right-hand front side of the engine provides electric current for charging the batteries and for other electrical requirements of the tractor. A transistorized alternator-regulator is mounted inside the alternator. The regulator controls the voltage output of the alternator.

Preventing Damage to Alternator and Regulator

Failure to observe the following rules will probably result in damage to the tractor wiring, the alternator, or the regulator.

(1) Never attempt to polarize an alternator.

(2) Disconnect the batteries when working near or when working on the alternator.

(3) If the alternator wiring is disconnected, be sure that it is properly connected BEFORE the batteries are connected.

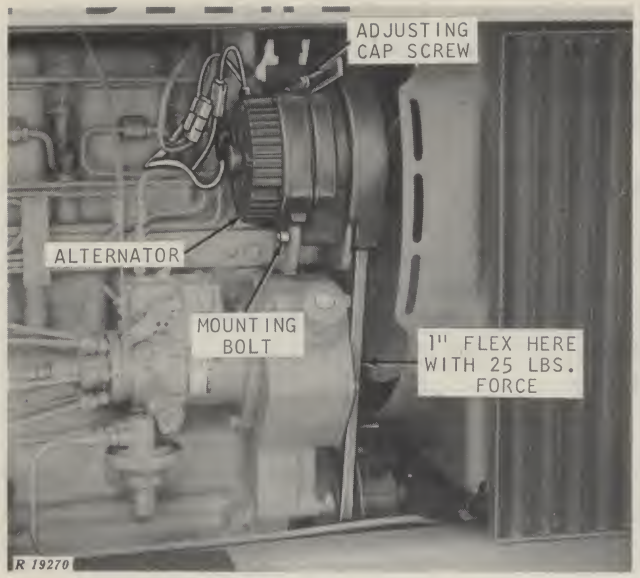
(4) The alternator should not be operated on an open circuit (batteries disconnected or with a disconnected wire from the alternator to the battery).

(5) Do not short across or ground alternator or charging circuit terminals. The alternator output terminal is "hot" at all times.

(6) When connecting a battery charger or a booster battery, connect POSITIVE (+) TO POSITIVE(+) and negative to a good ground on the tractor frame.

Adjusting Belt Tension

After every 200 hours of operation or whenever necessary, check the belt tension.

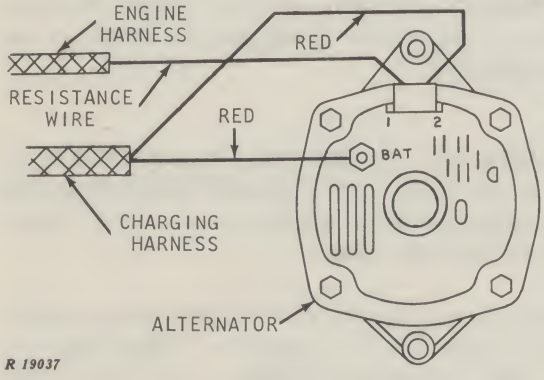


Belt Adjustment

With the mounting bolt and adjusting cap screw loose, apply outward force to the FRONT alternator frame until a firm push (25-pound force) on a belt midway between the two pulleys will deflect the belt 1 inch (can be measured using JDST-28 belt tension gauge that is available from your dealer). Tighten the alternator in this position. Alternator may be damaged if pressure is applied to the rear alternator frame.

Alternator Connections

If for any reason the alternator is disconnected, connect it as shown.



Alternator Connections

Starter

The engine is cranked by a heavy-duty starter, located on the left-hand side of the engine. It is built to carry a big load for a short period of time. A solenoid switch on top of the starter makes the electrical connection between the starter and the batteries.

IMPORTANT: Never operate the starter for more than 30 seconds at a time. After 30 seconds, allow at least two minutes for the starter to cool. After a false start, be sure that the starter has stopped completely before attempting another start.

If the starter responds normally, it can usually be considered to be in good condition. However, periodic checking of the starter and its connections may be necessary.

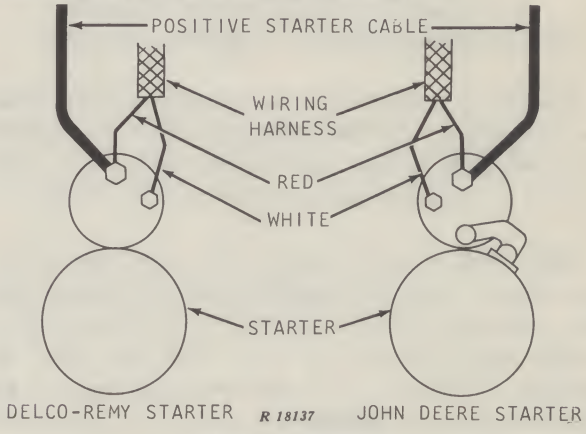
Checking Causes of Sluggish Starter

The usual causes of a sluggish starter (other than the starter) are run-down batteries, loose connections, defective wiring, or some condition in the engine that puts a heavier load on the starter. Check the batteries and the condition of the wiring. The wiring connections should be clean and tight. At low temperatures, be sure the engine crankcase oil is of the correct viscosity.

See your John Deere dealer if these checks fail to improve starter performance.

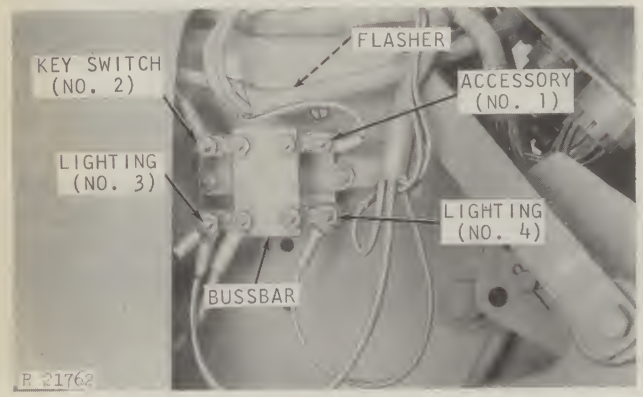
Starter Connections

If the starter wires and cable are disconnected, connect them as shown in the illustration.

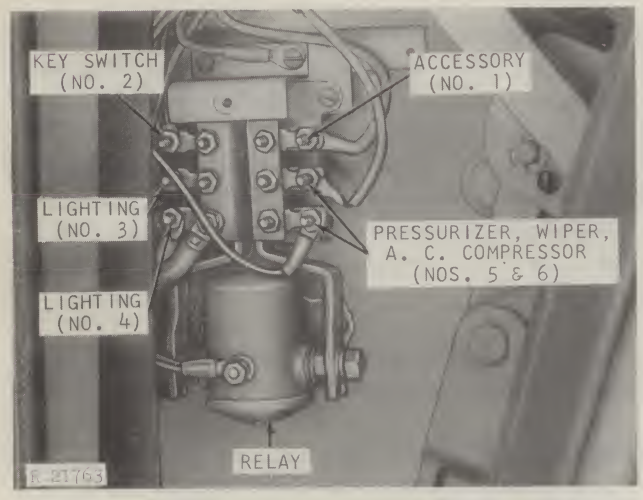


Starter Connections

Circuit Breakers



Circuit Breakers and Flasher Location (Tractor Without Sound-Gard Body)



Lighting Circuit Breakers (Tractor with Sound-Gard Body shown. Insulating circuit breaker cover removed to show circuit breakers.)

Most wiring circuits are protected by circuit breakers mounted under the left-hand cowl. If a circuit becomes overloaded, the circuit breaker will open and will stay open as long as the circuit is turned on.

The circuit breakers are remote reset type breakers (flow of current through the breaker must be shut off before the breaker will reset). If turning off the switch that controls the circuit will not reset the breaker, disconnect the service disconnect in the heavy wire on the engine side of the front wall of the Control Island.

See your John Deere dealer if the circuit breaker fails to operate properly. Also see your dealer for instructions on connecting accessories to the electrical load center.

Lights

Sealed-Beam Lamps

The tractor has two sealed, dual-beam headlights. Sealed-beam front-mounted flood lights are available from your dealer. See page 26 for adjusting instructions.

The rear flood lamps are also sealed-beam units. See your John Deere dealer for replacement sealed-beam units. Remove the sealed-beam unit from the rubber bezel when replacing a sealed-beam unit.

Bulbs

The instrument cluster is illuminated by two wedge-base bulbs. The air cleaner indicator lamp and the transmission oil indicator lamp bulbs are wedge-base bulbs. To remove the lamp socket from the instrument, turn it counterclockwise one quarter turn. Remove the lamp from its socket by pulling straight outward. When installing the lamp socket in the instrument cluster, push inward before turning. The hi-beam indicator lamp bulb and the tachometer lamp bulb are miniature bayonet base bulbs. Remove the tractor cowl to gain access to these instrument bulbs.

See your John Deere dealer for replacement bulbs in the taillights, flashing warning lamps, indicator lamps on the instrument panel, and the lamps for instrument lighting.

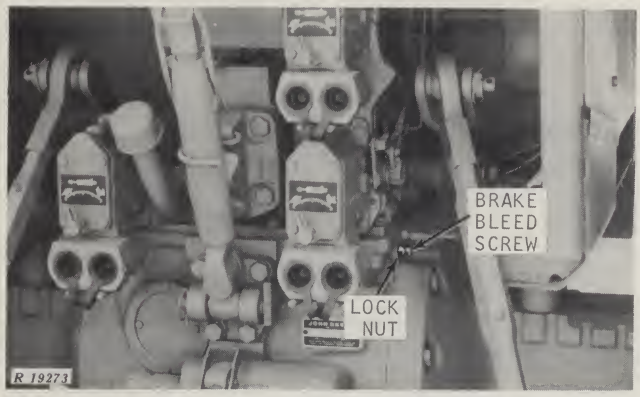
Flasher

The flasher for the flashing warning lamps is attached to the inside of the left-hand control support (see illustration at left). To gain access to the flasher, remove the left-hand cowl.

NOTE: In some areas flashing lights are prohibited by local regulations. If necessary, disconnect the flasher from the wiring harness and connect the AR41694 wiring lead with connector in place of the flasher.

POWER BRAKES

The power brakes should be bled after every 200 hours of operation, or whenever brake pedal travel exceeds 4-3/8 inches (measure from pedal to pedal) on the third application after the engine is stopped and the accumulator discharged. Discharge the accumulator by pumping the pedals slowly until the pedals go all the way down.



Brake Bleed Screw and Lock Nut

To bleed the brakes, start the tractor engine and loosen the bleed screw lock nut 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.

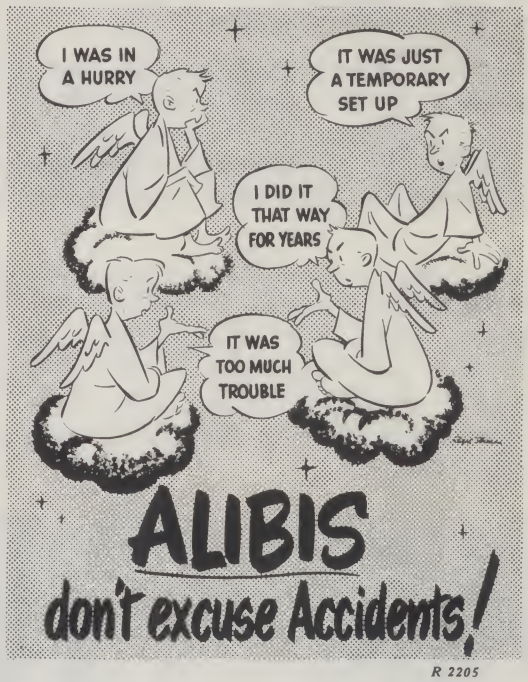
Discharge the accumulator and check the pedal travel again. Repeat the bleeding procedure if the travel is excessive. If bleeding the brakes does not correct the difficulty, consult your John Deere dealer.

ACCUMULATOR

CAUTION: Escaping hydraulic oil under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines or accumulator, be sure to relieve all pressure. To do so, stop engine, loosen right-hand brake bleed screw, and hold the right-hand brake pedal all the way down for a few minutes. Before applying pressure to the system, be sure all connections are tight and that lines, pipes, and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

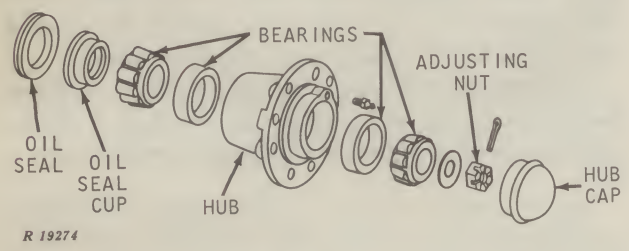
The accumulator will supply oil to apply each brake 5 times at 5-second intervals after the engine has been stopped for at least 15 minutes. Pedal travel should not exceed 3 inches. If the pedal travel exceeds 3 inches, the accumulator could have lost some of its precharge of dry nitrogen at 500 psi. When this occurs, the accumulator must be recharged. See your John Deere dealer for this service.



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.

Adjusting Bearings

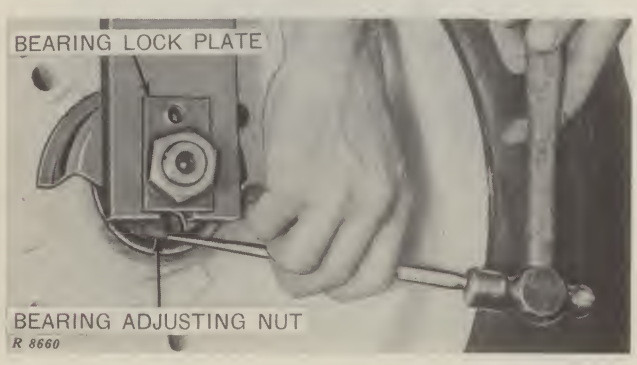


Front Wheel Bearings (Double Front Wheel, Roll-O-Matic, or Wide Front Axle)

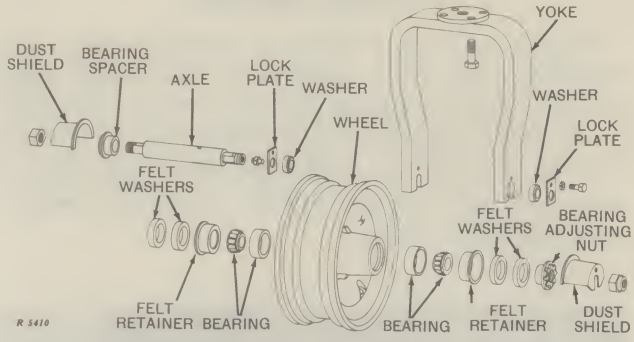
To adjust the bearings, remove the hub cap and cotter pin. Draw the adjusting nut up until a slight drag is felt when the wheel is rotated. If the adjusting nut has to be turned three or four castellations, remove the wheel and inspect the bearings.

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.

If the tractor has a single front wheel, 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 to the closest notch and tighten the lock plate screw. Tighten the axle nut. Bend the corner of the lock plate against the axle nut.



Adjusting Single Front Wheel Bearing



Single Front Wheel

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 John Deere Multi-Purpose Lubricant or its equivalent. Install the wheels and adjust the front wheel bearings.

TIRES

Check the tires for air inflation (page 21) 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.

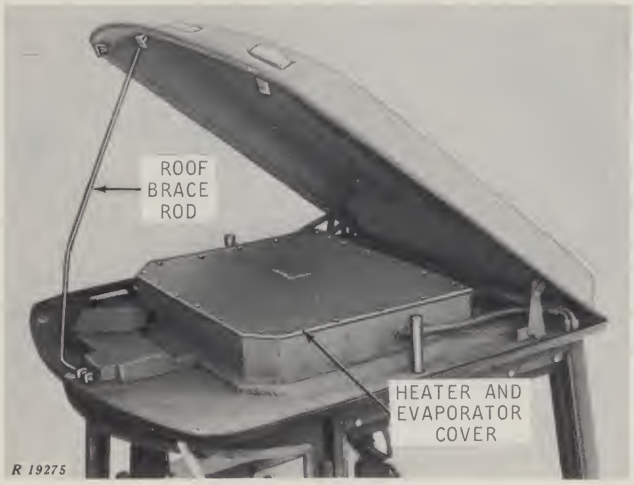
ROLL-GARD

When installing a two-post Roll-Gard, tighten the bolts with sufficient torque to hold the lower plate evenly against both axle housings. Then in a diagonal sequence, tighten the bolts to 50 ft-lbs torque. Retighten the bolts in the same sequence to 300 ft-lbs torque. After a few hours service, retighten the cap screws and keep them tight.

⚠ CAUTION: A tractor roll-over may place a severe stress on the Roll-Gard structure. Therefore, reuse of the Roll-Gard (two-post, four-post, or Sound-Gard Body Frame) is not recommended if its structural members have been bent, buckled, or stretched.

SOUND-GARD BODY

Roof



Roof

After operating in extremely dusty conditions for a considerable length of time, it may be necessary to open the roof to remove the trapped dirt.

To open the roof, remove the two screws on top of the roof at the lift points. Remove the three screws at the front lower side. Use the brace rod to hold the roof open.

Bleeding Heater

Running the engine at fast idle speed will usually circulate coolant through the heater to remove the trapped air from the heater whenever the cooling system is drained or refilled.

Heater Core

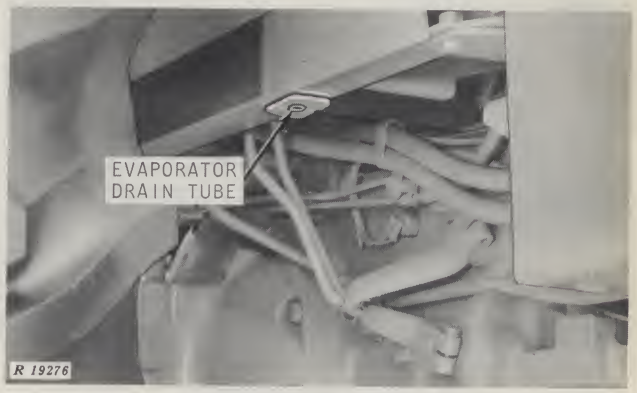
For satisfactory heater operation, be sure heater core is not plugged with dirt. To gain access to the heater core, open the roof and remove the heater and evaporator housing cover. Use compressed air to clean the heater core.

Use antifreeze in the engine cooling system to prevent freezing of coolant trapped in the heater core.

Air Conditioner Condenser and Evaporator

If the clogged condenser indicator lamp comes on or if a decrease in air conditioner efficiency is noticed, the condenser core or evaporator core may be plugged. To clean the condenser core, see page 63. To gain access to the evaporator core, open the roof and remove the heater and evaporator housing cover. Clean the core with compressed air.

Evaporator Drain Tube Trap



Evaporator Drain Tube

If water is not draining from the evaporator properly, check the evaporator drain tube trap for clogging or for a dry trap. If the water has evaporated from the trap, air will be sucked up the drain tube and may hold the condensate water in the evaporator housing. At the beginning of an air conditioning season, it may be necessary to prime a dry trap. To do so, hold a garden hose against the lower end of the drain hose momentarily to fill the trap with water.

Sight Glass

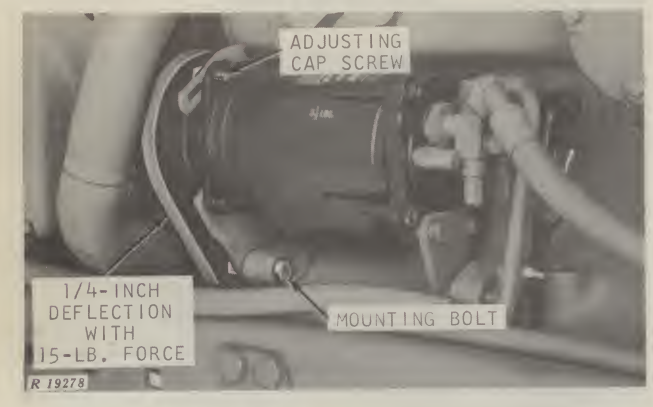
Sight Glass

A sight glass located on left-hand side inner wall of the Sound-Gard Body is used to determine if the air conditioning system has sufficient quantity of refrigerant.

The sight glass should be clear before starting the engine. Run the engine at 1900 rpm. Turn the blower on high speed and the temperature control knob to the coldest temperature. Bubbles will appear in the sight glass for a few minutes after starting the air conditioning system. At temperatures above 70°F., the bubbles will disappear and the sight glass should be clear.

If the bubbles do not stop flowing, see your John Deere dealer.

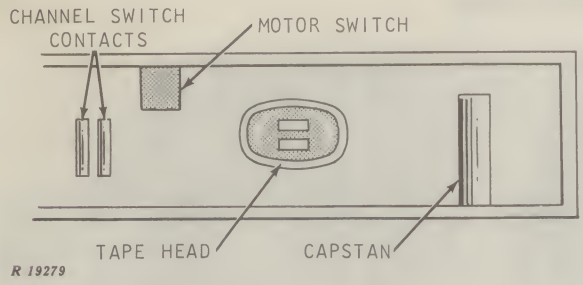
Compressor Belt Adjustment



Compressor Belt Adjustment

Whenever necessary, adjust the compressor drive belt. Loosen the compressor mounting bolt and adjusting cap screw. Apply an outward force to the compressor so that a 15-pound force on the belt midway between the compressor and crankshaft pulleys will deflect the belt 1/4 inch. Tighten the compressor in this position.

Cleaning Tape Head



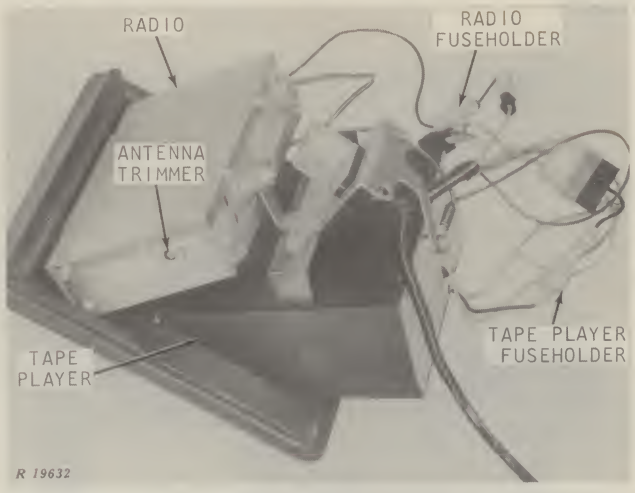
Tape Head

After many hours of operation, brownish colored oxides from the tape will accumulate on the tape head. To remove this accumulation, use a special "non-abrasive cleaning cartridge" as instructed on the cartridge.

If cleaning cartridge is not available, use a cotton swab soaked with isopropyl (rubbing) alcohol. Do not use carbon tetrachloride, acetone, or other solvents since they may damage the tape head. NEVER use anything that would scratch or mar the tape head. Press up on motor switch with a pencil when cleaning the capstan. Clean the channel switch contacts also.

Using a magnetized tool on the switch may magnetize the tape head. Increased background noise and loss of high frequency response can be caused by a magnetized tape head. When this happens, use a demagnetizer at the tape head as instructed by the manufacturer.

Radio and Tape Player Fuses



Radio and Tape Player Fuses

The radio in a Sound-Gard body is protected by a 5 amp fuse. The tape player is protected by a separate 5 amp fuse.

To gain access to the radio fuse on a radio without tape player, remove the six screws. The radio, speaker and grille are removed as a unit.

To gain access to a fuse on a radio and tape player, open the Sound-Gard body roof. Remove the two radio and tape player assembly mounting screws from the top side of the inner roof. Then remove the six screws from the grille. Lower radio and tape player assembly.

Antenna Trimmer Capacitor Screw

If radio reception seems poor, adjust the antenna trimmer capacitor screw. To do so, select a weak station near 1400Kc and adjust the trimmer screw to obtain maximum volume. On some radios, the antenna trimmer is located behind the tuning knob. Remove the tuning knob and the dummy knob beneath it. Insert a screwdriver in the hole just below the tuning shaft.

If there is no hole in this location, the antenna trimmer is located as shown in the above illustration. If tractor does not have a tape player, remove the radio and speaker assembly from inside the Sound-Gard Body. If tractor has a tape player, open the roof and remove the right-hand wiper motor cover to gain access to the trimmer screw.

Speakers

IMPORTANT: Disconnect power or battery ground cable if speaker leads are to be disconnected. Inadvertent grounding of speaker leads with the unit turned on will usually damage the unit.

Tractor Storage

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

STORING THE TRACTOR

Use the AR41785 Engine Storage Kit and an extra quart of AR41870 Internal Corrosion Inhibitor or its equivalent when storing the tractor. Storing a tractor without using the storage kit may result in corrosion and a short service life.

Change the engine crankcase oil before storing the tractor. Used engine crankcase oil will NOT protect bearings and other surfaces from rusting or corroding during a storage period. With the engine warm, drain the engine crankcase, replace the filter element, and fill the crankcase with new John Deere Torq-Gard engine oil or its equivalent of the proper viscosity (page 45).

Service the air cleaner. See page 50.

Drain, flush, and fill the cooling system. Use clean soft water and John Deere Summer Coolant Conditioner (T19566) or, if freezing weather is anticipated, add enough antifreeze to protect the cooling system from freezing.

Add 7 ounces of corrosion inhibitor from the storage kit to the transmission-hydraulic system.

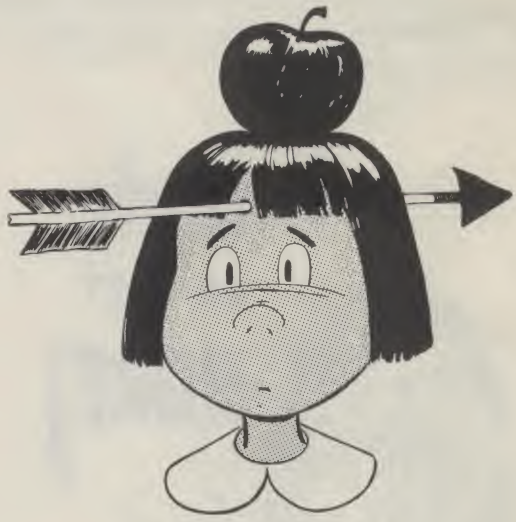
Drain the fuel tank and add back 2 gallons of fuel. Add 3/4-pint of John Deere Diesel Fuel Conditioner to the fuel tank.

Run engine to circulate coolant with the thermostat open and to circulate the fuel conditioner. Cycle all hydraulic functions including steering and brakes to distribute the inhibitor to all hydraulic components.

Drain fuel tank. Close the drains and add 9 ounces of corrosion inhibitor to the fuel tank. Add 17 ounces of inhibitor to the engine crankcase.

Disconnect the air intake pipe from the intake manifold. Place 3 ounces of inhibitor in the manifold. Reconnect the air intake pipe. Pull the engine stop knob out.

Turn the engine slowly for two revolutions (the engine must not fire). Push the stop knob in.



Accidents don't just happen
They are CAUSED!

R 2380

Loosen the fan belt and the air conditioning compressor belt.

Remove, clean, and store the batteries as instructed on page 66.

Seal the following tractor openings with the plastic bags and tape from the kit and use the check list on the tag: air inlets, exhaust muffler, crankcase breather tube, fuel tank ventilated cap; radiator overflow hose, and the transmission hydraulic filler cap and breather.

Coat with a grease or corrosion preventative the exposed metal surfaces such as axles and piston rods of hydraulic cylinders.

Raise the tires so they do not touch the ground and protect them from heat and sunlight.

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.

Store the tractor in a dry protected place. If it is necessary to store the tractor outside, always cover it with a water proof canvas or other suitable protective material to protect the switches, instruments, tires, and other tractor components.

R 2235

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, electrical system, and transmission-hydraulic system. Follow the check list provided on the tag with the AR41785 kit.

Remove the batteries from storage. Install them on the tractor and connect the cables (page 66). Adjust the alternator belt tension (page 66). Adjust compressor belt tension (page 72).

Check the engine and the transmission-hydraulic system oil level. Add oil if necessary. Check radiator coolant level.

Fill the fuel tank.

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

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


R 19321

⚠ CAUTION: Do not lubricate or adjust the tractor while engine is running unless specifically recommended.

Trouble Shooting

If your tractor shows a particular difficulty, check the symptoms listed on the following pages. Possible causes and remedies are given for each symptom. If the trouble is not corrected after eliminating these possible causes or remedies, consult your John Deere dealer.

ENGINE

Engine Hard to Start or Will Not Start

No fuel.
Old fuel or water in tank.
Drain and refill with fresh fuel. Page 60.
Fuel shut-off valve closed. Page 60.
Low ambient air temperature.
Use cold weather starting aids. Page 4.
Low battery output.
Check electrolyte level and specific gravity of each battery. Page 65.
Excessive resistance in starting circuit.
Clean and tighten all connections on batteries and starter. Page 66.
Crankcase oil too heavy.
Use oil of proper viscosity. Page 45.
Improper type of fuel.
Consult fuel supplier and use proper type of fuel for operating conditions. Page 44.
Water, dirt, or air in fuel system.
Drain, flush, fill, and bleed system. Page 61.
Clogged fuel filter.
Replace filter element. Page 61.
Dirty or faulty injectors.
Have your John Deere dealer check the injectors.
Slow starter speed.
See "Starter Cranks Slowly" page 77.

Engine Knocks

Insufficient oil.
Call your John Deere dealer.
Injection pump out of time.
See your John Deere dealer.
Low coolant temperature.
See "Below normal engine temperature." Page 75.
Engine overheating.
See "Engine Overheats", page 76.

Below Normal Engine Temperature

Defective thermostat.
Remove and check thermostat. Page 62.

Low Oil Pressure

Low oil level. Page 52.
Improper type of oil.
Drain and fill crankcase with oil of the proper viscosity and quality. Page 45.

Lack of Engine Power

Engine overloaded.
Reduce load or shift to lower gear.
Intake air restriction.
Service air cleaner. Page 50.
Clogged fuel filter.
Replace filter element. Page 61.
Improper type of fuel. Page 36.
Overheated engine.
See "Engine overheats." Page 75.
Below normal engine temperature.
Remove and check thermostat. Page 62.
Improper valve clearance. Page 64.
Dirty or faulty injectors.
Have your John Deere dealer check the injectors.
Injection pump out of time.
See your John Deere dealer.
Implement improperly adjusted.
See implement operator's manual.
Improper ballast.
Adjust ballast to load. Page 21.
Vent on fuel tank obstructed.
Clean fuel tank cap. Page 45.

ENGINE—Continued

Engine Runs Irregularly or Stalls Frequently

Low coolant temperature.
  If water temperature gauge is not in normal range, see "Below normal engine temperature." Page 74.
Clogged fuel filter.
  Replace filter element. Page 61.
Water, dirt, or air in fuel system.
  Drain, flush, fill, and bleed system. Page 60.
Dirty or faulty injectors.
  Have your John Deere dealer check the injectors.

Engine Overheats

Engine overloaded.
  Shift to lower gear or reduce load.
Low coolant level.
  Fill radiator to proper level.
  Check radiator and hoses for loose connections and leaks. Page 62.
Loose or defective fan belt.
  Adjust belt tension. Page 66.
Dirty cooling system radiator core, oil cooler, or grille screens.
  Remove all foreign matter from exterior of radiator core, oil cooler, and grille screens. Page 63.
Cooling system needs flushing. Page 62.
Defective thermostat.
  Remove and check thermostat. Page 62.
Defective temperature gauge.
  Check water temperature with thermometer and replace gauge if necessary. Page 62.
Faulty radiator cap.
  Have serviceman check radiator cap.

High Oil Consumption

Crankcase oil too light.
  Use proper viscosity oil. Page 45.
Oil leaks.
  Check for leaks in lines and around gaskets and drain plug.

High Fuel Consumption

Improper type of fuel. Page 44.
Clogged or dirty air cleaner.
  Service air cleaner. Page 50.
Engine overloaded.
  Reduce load or shift to lower gear. Page 10.
Improper valve clearance. Page 64.
Injection nozzles dirty.
  See your John Deere dealer.
Engine out of time.
  See your John Deere dealer.
Implement improperly adjusted.
  See implement operator's manual.
Engine not operating at correct temperature.
  Check thermostat. Page 62.

Engine Emits Black or Gray Exhaust Smoke

Improper type of fuel. Page 44
Clogged or dirty air cleaner.
  Service air cleaner. Page 50.
Defective muffler.
Engine overloaded.
  Reduce load or shift to a lower gear.
Injection nozzles dirty.
  See your John Deere dealer.
Engine out of time.
  See your John Deere dealer.

Engine Emits White Smoke

Improper type of fuel. Page 44.
Low engine temperature.
  Warm up engine to normal operating temperature.
Defective thermostat.
  Remove and check thermostat. Page 62.
Engine out of time.
  See your John Deere dealer.

TRANSMISSION

Transmission Oil Overheats (Power Shift)

Low oil supply.
  Fill system with correct oil. Page 54.
  Oil cooler air passages clogged.
  Clean oil cooler. Page 66.
Excessive shifting under heavy load.
  Reduce shifting or load.
Manual bypass valve open.
  Close valve. Page 37.
Clogged transmission oil filter element (front).
  Replace filter element. Page 57.
Clogged hydraulic oil filter element (rear).
  Replace filter element. Page 57.

Low Transmission Oil Pressure (Syncro-Range, Creeper, or Quad-Range Transmission)

Low oil supply.
  Fill system with correct oil. Page 54.
Manual bypass valve open.
  Close valve. Page 37.
Clogged transmission-hydraulic oil filter element.
  Replace filter element. Page 54.

ELECTRICAL SYSTEM

Voltmeter Indicates Low Battery Voltage

Excessive start-stop operation.
Low charging voltage.
High resistance in circuit.
Defective battery.
- Check specific gravity. Page 65.
- Check electrolyte level. Page 65.

Voltmeter Indicates Low Charging Voltage

Low engine rpm.
Defective battery.
- Check specific gravity. Page 65.
- Check electrolyte level. Page 65.

Defective alternator.
Slipping belt.
- Tighten belt. Page 66.

Voltmeter Indicates Excessive Charging Voltage

Faulty connection to regulator.
- Check orange and red wires. Page 67.

Defective regulator.

Batteries Will Not Charge

Loose or corroded connections.
- Clean and tighten battery connections. Page 66.

Sulfated or worn-out batteries.
- Check specific gravity of each battery. Page 65.
- Check electrolyte level of each battery. Page 65.

Loose or defective alternator belt.
- Adjust belt tension. Page 66.
- Replace belt. Page 66.

Starter Inoperative

Loose or corroded connections.
- Clean and tighten loose connections. Page 66.

Low battery output.
- Check specific gravity of each battery. Page 65.
- Check electrolyte level of each battery. Page 65.

Transmission in gear.
- Place transmission in park. Page 11, 12 or 13.

Starter Cranks Slowly

Low battery output.
- Check specific gravity of each battery. Page 65.
- Check electrolyte level of each battery. Page 65.

Crankcase oil too heavy. Page 45.
Loose or corroded connections.
- Clean and tighten loose connections. Page 66.

Light System Does Not Function; Rest of Electrical System Does Function

Tripped circuit breakers.
- Turn light switch off for 1 minute. Page 68.

Entire Electrical System Does Not Function

Faulty battery connection.
- Clean and tighten connections. Page 66.

Sulfated or worn-out batteries.
- Check specific gravity and electrolyte level of each battery. Page 65.

HYDRAULIC SYSTEM

Entire Hydraulic System Fails to Function

Low oil supply.
- Fill system with proper oil to mark on dipstick. Page 54.

Clogged filters.
- Replace filters. Page 54 or 57.

Hydraulic pump shut off.
- Back screw out to internal stop. Page 5.

Possible dirt in hydraulic pump.
- Shut off pump and turn it on. Check filter for clogging. Pages 5 and 58.

Oil Overheats

Low oil supply. Page 54.
Oil cooler air passages clogged.
- Clean oil cooler. Page 63.

Clogged filters.
- Replace filters. Page 54 or 57.

Manual bypass valve open.
- Close valve. Page 37.

ROCKSHAFT, 3-POINT HITCH, AND QUIK-COUPLER

Insufficient Transport Clearance

Center link too long.
Adjust center link. Page 30.
Lift links too long.
Adjust lift links. Page 30.
Implement not level.
Level implement by adjusting lift links or center-link.
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

Rockshaft speed-of-drop valve not set properly.
Adjust speed-of-drop. Page 28.

Hitch Too Active

Selector lever in wrong position.
Move selector lever toward "ZERO" position.

No Hitch Response to Draft Load or Insufficient Hitch Response

Selector lever in wrong position.
Move selector lever toward "MAX" position.
Rockshaft speed-of-drop too slow.
Adjust speed-of-drop. Page 28.

REMOTE HYDRAULIC CYLINDERS

Remote Cylinder Will Not Lift Load

Excessive load.
Adjust auxiliary springs on implement or reduce load.
Coupler lever not completely turned to unseat balls.
Attach hoses to coupling correctly. Page 37.
Incorrect remote cylinder size.
Use correct size cylinder.

Remote Cylinder Rate of Travel Too Slow or Too Fast

Incorrect flow control valve setting.
Adjust rate of operation. Page 37.

Direction of Remote Cylinder Travel is Reversed

Improper hose connections.
Reverse hose connections. Page 37.

BRAKES

Pedal Bounces

Air in system.
Bleed brakes. Page 69.

No Manual Brakes

Air in system.
Bleed brakes. Page 69.
Bleed screws left open.
Bleed brakes and tighten bleed screws. Page 69.
Accumulator discharged.
See your John Deere dealer.

SOUND-GARD BODY

Blower Not Keeping Dust Out

Defective seal around filter element.
Check seal condition. Page 55.
Check filter for proper installation. Page 55.
Defective filter.
Replace filter. Page 55.
Excessive air leak.
Seal air leaks.
Blower air flow too low.
See "Blower air flow too low."

Blower Air Flow Too Low

Clogged filter or air intake screen.
Clean, Page 55.
Heater core or evaporator core clogged.
Clean, Page 71.

Heater Will Not Heat

Air trapped in heater core.
Bleed the heater. Page 71.
Defective thermostat in engine.
Replace thermostat. Page 62.
Air conditioner turned on.
Turn off air conditioner.

Heater Will Not Shut Off

Heater hoses connected improperly.
See your dealer.

Air Conditioner Not Cooling

Blower air flow too low.
See "Blower air flow too low."
Compressor belt slipping.
Check belt tension. Page 72.
Lack of refrigerant in conditioner.
Check sight glass. Page 71.
Evaporator core clogged.
Clean. Page 71.
Condenser core clogged.
Clean. Page 63.
Heater turned on.
Compressor not running.
See "Compressor not running."

Clogged Condenser Indicator Light On And Compressor Not Running

Condenser core clogged.
Clean. Page 63.
Side grille screens clogged.
Clean. Page 63.

Water Leaking From Console

Plugged drain hoses.
Clean. Page 71.
Plugged drain traps.
Clean. Page 71.
Dry drain trap.
Prime with water. Page 71.

Poor Sound Quality of Tape Player

Oxide build-up on tape head.
Clean tape head and capstan drive. Page 72.

Automatic Channel Switch Does Not Function

Dirty channel switch contacts.
Clean with cleaning cartridge or isopropyl alcohol. Page 72.

Loss of High Frequency Response and Increased Background Noise of Tape Player

Tape head magnetized.
Use demagnetizer. Keep magnetized tools away from tape head.

Slow Operation or Erratic Operation of Tape Player

Faulty tape cartridge.
Try 2 or 3 other cartridges before contacting serviceman.

Radio or Tape Player Does Not Function

Blown fuse.
Replace fuse. Page 72.

Specifications

HORSEPOWER:*
- Observed at PTO ..... 100.32 h.p.

ENGINE:
- Type ..... 6-cylinder, in-line, valve-in-head
- Engine speeds:
- Normal slow idle ..... 800 rpm
- Working range ..... 1500 to 2200 rpm
- Bore and stroke ..... 4-1/4 in. x 4-3/4 in.
- Displacement ..... 404 cu. in.
- Compression ratio ..... 16.8 to 1
- Firing order 1-5-3-6-2-4
- Intake valve clearance ..... 0.018 in.
- Exhaust valve clearance ..... 0.028 in.
- Injection pump timing ..... TDC
- Lubrication ..... Force-feed pressurized with full-flow oil filter
- Cooling ..... Pressurized, 2 thermostats

CAPACITIES:
- Fuel tank ..... 37 U.S. gals.
- Crankcase (includes filter) ..... 17 U.S. qts.
- Transmission-hydraulic system:* *
- Syncro-Range and Creeper ..... 16 U.S. gals.
- Quad-Range ..... 16 U.S. gals.
- Power Shift ..... 15.5 U.S. gals.
- Cooling system (add 2 U.S. qts. for heater) . 24 U.S. qts.
- Hi-crop final drive housings ..... 2-1/4 U.S. qts.

SYNCRO-RANGE TRANSMISSION:
- Type ..... Syncro-Range, constant mesh
- Perma-Clutch ..... Hydraulically operated, multiple disk, wet clutch
- Gear selections ..... 8 forward and 2 reverse
- Shifting ..... 4 stations, synchronized forward speed shifting within stations

CREEPER TRANSMISSION:
- Type ..... 2 speed, collar-shifted planetary and 8 speed Syncro-Range transmission with constant mesh gears
- Perma-Clutch ..... Hydraulically operated, multiple disk, wet clutch
- Gear selections ..... 13 forward and 4 reverse
- Shifting
- Creeper control lever . Collar shifted between ranges
- Speed selector lever .... Mechanically synchronized forward speed shifting of Syncro-Range transmission

QUAD-RANGE TRANSMISSION:
- Type ... 2 speed, power shifted planetary and 8 speed, Syncro-Range transmission with constant mesh gears
- Perma-Clutch ..... Hydraulically operated multiple disk, wet clutch
- Gear selections ..... 16 forward and 6 reverse
- Shifting
- Range selector lever .. Collar shifted between ranges
- Speed selector lever
- Forward-rearward lever movement ... Mechanical synchronized forward speed shifting of Syncro-Range transmission
- Sideways lever movement ..... Power shifted planetary transmission speeds

POWER SHIFT TRANSMISSION:
- Type ..... Planetary gears, hydraulically actuated wet disk clutches and brakes
- Gear selections ..... 8 forward and 4 reverse
- Shifting ..... Hydraulic, power shifting controlled by speed selector

POWER TAKE-OFF:
- Type ..... Independent PTO with rear power take-off controlled by hand-operated clutch lever
- Stub shafts used for dual speed PTO conversion
- Speed (2200 engine rpm) ..... 540 or 1000 rpm
- PTO ahead of drawbar hitch point .... 540 rpm—14 in. 1000 rpm—16 in.

POWER FRONT-WHEEL DRIVE
- Type ..... Hydraulic motor driven with planetary gear reduction in wheel hub, uses pressure oil from hydraulic system
- Torque ..... Low (series connected) and high (parallel connected)
- Controls ..... Solenoid-operated control valves, synchronized with transmission controls

* *Above horsepower figure is in official test at 2200 engine rpm.*

* * *Add approx. 4-1/2 gals. if equipped with Power Front Wheel Drive.*

HYDRAULIC SYSTEM:
- Type ..... Closed center, constant pressure. Includes power steering, power brakes, implement control, and transmission and differential lubrication.
- Standby pressure ..... 2250 psi

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

ELECTRICAL SYSTEM:
- Type ..... 12-volt, negative grounded
- Batteries ..... Two, 6-volt, 5D group, 800 amps cold cranking at 0° F., 376 minutes reserve capacity at 25 amps
- Alternator .... 12-volt, 55 amp with Sound-Gard Body, 37 amp without Sound-Gard Body

FRONT TIRES* ..... 9.5L-15, 6-ply rating

REAR TIRES* ..... 18.4-34, 6-ply rating

* *Additional tire sizes available.*

FRONT WHEEL TREAD ..... See page 17

REAR WHEEL TREAD ..... See page 19

GROUND SPEEDS ..... See page 10.

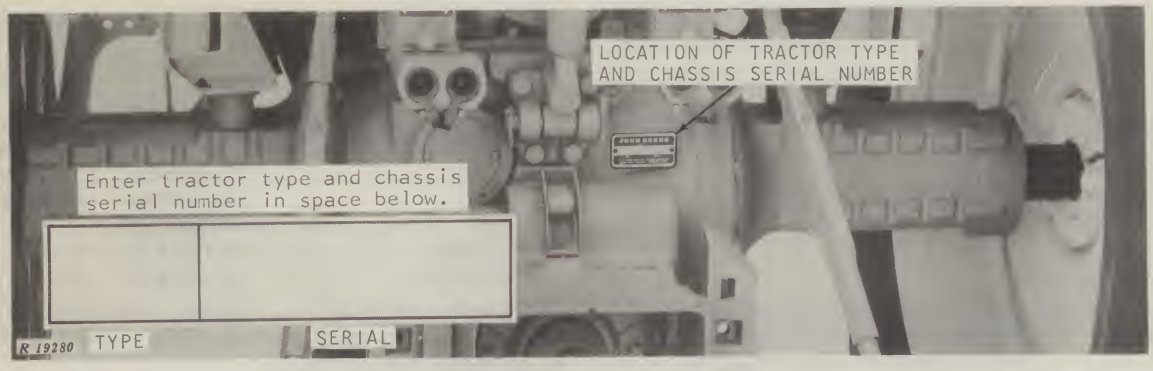
DIMENSIONS:

	Tractor with Roll-O-Matic less Roll-Gard	Tractor with wide front axle and Sound-Gard Body
Wheel base	101-1/4 in.	104 in.
Over-all length	151-3/4 in.	151-3/4 in.
Height to muffler cover	89 in.	118-3/4 in.
Height to steering wheel	81-1/8 in.	---
Height to top of Sound-Gard Body	---	109-7/8 in.
Over-all width (regular axle) .	89-5/8 in.	89-5/8 in.
Width at roof	---	54-3/8 in.
Body width at fender	---	54-1/4 in.
Turning radius	113 in.	136 in.
SHIPPING WEIGHT* *	8,006 lbs.	9,600 lbs.

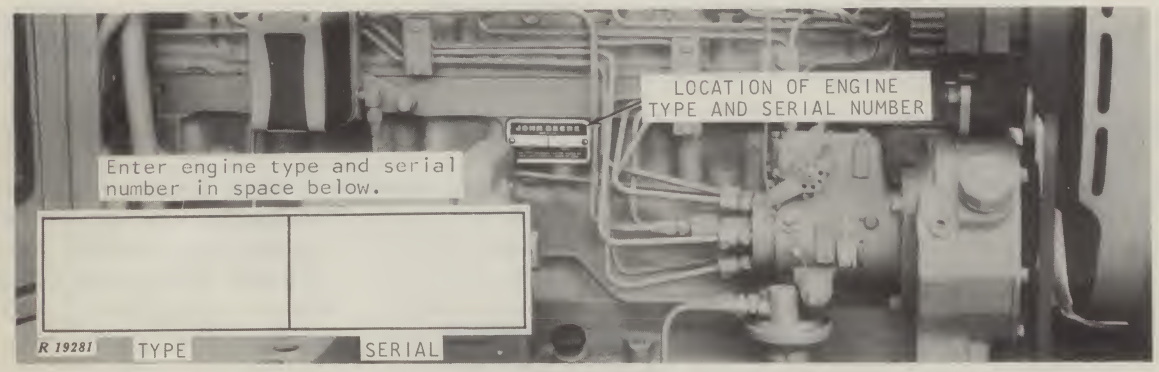
* * With equipment for average field service, less fuel and ballast. Add 375 lbs. if equipped with a Power Shift transmission. Add 125 lbs. if equipped with a Quad-Range transmission. Add 450 lbs. if equipped with a 4-post Roll-Gard. Add approximately 1000 lbs. if equipped with a Power Front-Wheel Drive.

(Specifications and design subject to change without notice.)

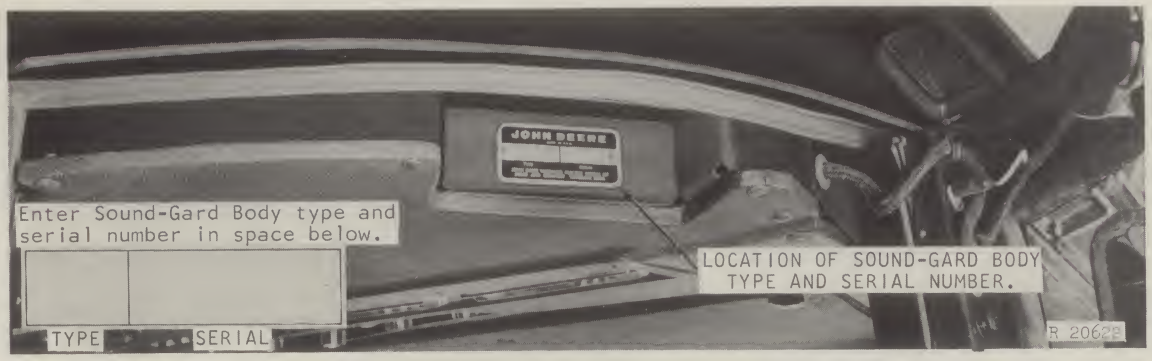
SERIAL NUMBERS



Tractor Type and Tractor Chassis Serial Number



Engine Type and Engine Serial Number



Sound-Gard Body Type and Serial Number

Index

MEMORANDA

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NOTE: If you want manuals or catalogs for equipment not shown on this list, list the model number, serial number and name of the equipment below.

_____

_____

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FOS Manual - Fuels, Lubricants and Coolants	FOS-58B		2.90
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SP-219 Litho in U.S.A. NOV 72

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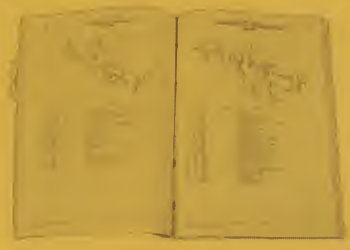

A parts catalog containing exploded view illustrations and lists of all parts is useful when purchasing service parts. Helps identify the correct parts. Useful in assembling and disassembling.

OPERATOR'S MANUAL

An extra copy of the operator's manual may be important if the copy furnished with your machine is misplaced.

TECHNICAL MANUAL

The technical manual is a concise service guide for your machine. A partial list of contents includes: specifications and wear tolerances, diagnosis and adjustments, exploded view illustrations, photographs of special assembly and disassembly procedures, hydraulic oil flows, and wiring diagrams.

FOS MANUALS

Fundamentals of Service manuals contain basic fundamentals of service and operation. These manuals are applicable to most types and makes of machinery. Each starts with basic theory; covers operation, basic servicing, diagnosis, and testing. They are fully illustrated with plenty of colorful diagrams.

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