

820 Tractor



JOHN DEERE

OPERATORS MANUAL

820
Tractor

OML29340 Issue J2 English

John Deere Tractor Works
OML29340 Issue J2

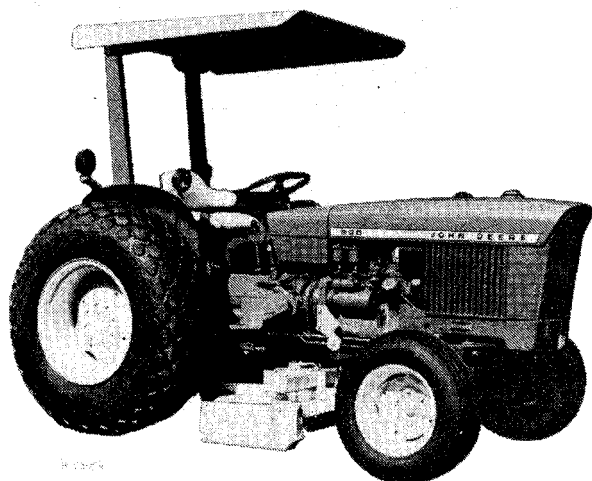
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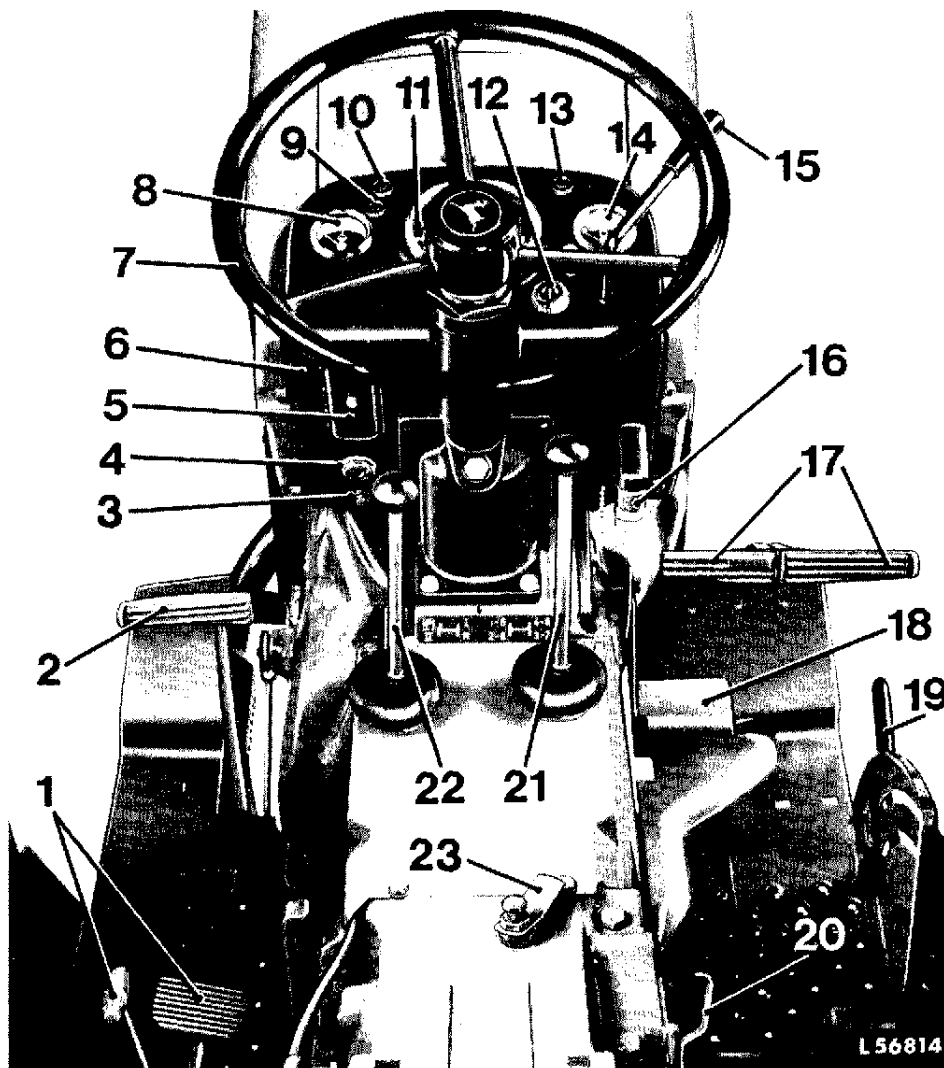
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Controls and Instruments

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



- 1—Differential Lock (Lever and Pedal)
- 2—Clutch Pedal
- 3—Starter Button
- 4—Main Switch (Electrical System)
- 5—Fuse Box
- 6—Instrument Panel
- 7—Steering Wheel
- 8—Water Temperature Gauge

- 9—Air Cleaner Indicator Light
- 10—Alternator Indicator Light
- 11—Speed-Hour Meter
- 12—Light Switch
- 13—Engine Oil Pressure Indicator Light
- 14—Fuel Gauge
- 15—Hand Throttle
- 16—Starting Fluid Adapter

- 17—Brake Pedals
- 18—Foot Throttle
- 19—Rockshaft Control Lever
- 20—Rockshaft Selector Lever
- 21—Gear Shift Lever
- 22—Range Shift Lever
- 23—Rate-of-Drop Lever

INSTRUMENTS

Control Lights

Alternator



Engine Oil Pressure



The above control lights should light up as soon as main switch is moved to position "1". If this is not the case, a burnt-out bulb or blown fuse may be the cause. Replace defective bulb or fuse.

The control lights should go out as soon as the engine is running and the engine speed has been raised. If this is not the case or if a light goes on during operation, immediately shut off engine and correct the problem.

If alternator indicator light goes on during engine operation, the alternator is not charging. Check for loose alternator connections, slackness of V-belt or defective alternator.

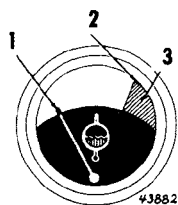
If engine oil pressure indicator light goes on during engine operation, stop the engine, check oil level and condition of engine oil filter.

Air Cleaner Indicator Light



If air cleaner indicator light goes on, clean air filter element or replace element after it has been cleaned six times.

Coolant Temperature Gauge

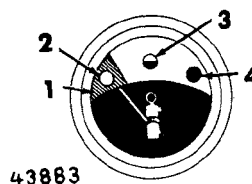


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- 1—100°F (38°C)
- 2—219°F (104°C)
- 3—Red warning zone

If the gauge needle is in the red warning zone, the engine is overheating and must be stopped at once. Check coolant level in radiator and check cooling system for leaks.

Fuel Gauge



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- 1—Red warning zone
- 2—Empty tank
- 3—Half-full tank
- 4—Full tank

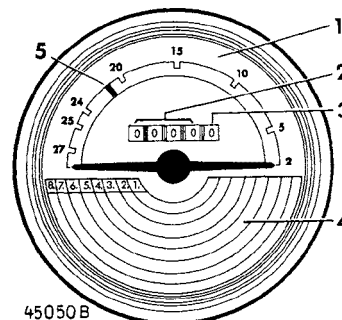
The fuel gauge shows the amount of fuel in tank, from "empty" to "half-full" and "full".

Refill tank as soon as needle points to red zone.

Never run fuel tank completely dry.

Speed-Hour Meter

The speed-hour meter facilitates the economical use of the tractor under all operating conditions. It also facilitates choosing the right gear.



45050B

The speed-hour meter shows the following:

- 1 — Engine speed on the upper half of the dial. The figure shown multiplied by 100 indicates the actual number of engine revolutions.
- 2 — Hours of operation in full hours.
- 3 — Hours of operation in tenths of hours.

The hour meter facilitates close observation of the proper service intervals.

- 4 — The tractor speed for the gear engaged.
- 5 — PTO operation. The green mark shows the engine speed required for powershaft operation,



Operation

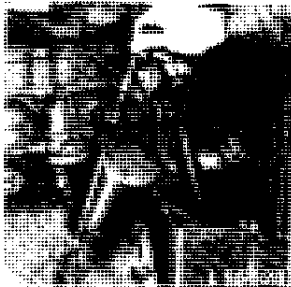
PRE-STARTING INSPECTION

IMPORTANT: If the tractor is to be operated without the battery (for instance, using a slave battery for starting), **NEVER** interrupt the circuit by turning the main switch key to position "O" or "P." Connect slave battery in the proper polarity: **Negative to ground.**

Further details about the alternator are given on page 54.

The following items must be checked daily before commencing work:

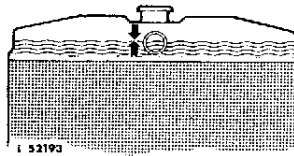
Oil Level in Engine Crankcase



If oil level has dropped to bottom mark on dipstick, add sufficient oil to bring oil level up to top mark on dipstick.

See page 34 for correct oil.

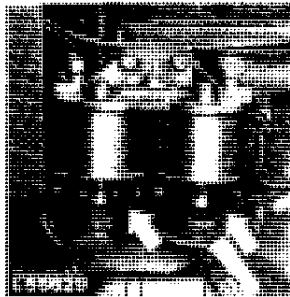
Radiator Coolant Level



Coolant should be maintained at a level midway between radiator core and filler neck.

See "Cooling System" section for correct coolant mixture.

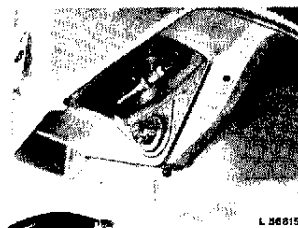
Fuel Filter Sediment Bowls



Check sediment bowls for water or dirt deposits.

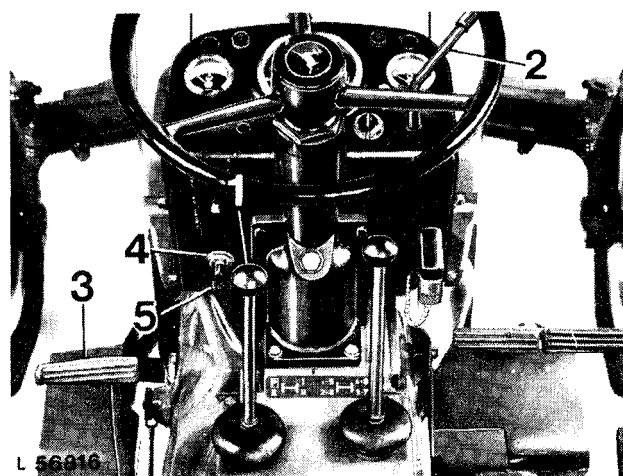
See page 50 for instructions on cleaning sediment bowls.

Fuel Shut-Off Valve



Make sure fuel shut-off valve located under fuel tank is open.

STARTING THE ENGINE



- 1 — Range shift lever in neutral or park position.
- 2 — Place hand throttle in halfway-open position.
- 3 — Depress clutch pedal to decrease drag on engine.
- 4 — Turn switch key to position "1".
- 5 — Depress starter button. As soon as engine starts, release button. Do not crank engine for more than 30 seconds at a time. Wait at least two minutes before trying again.

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

Release clutch pedal. In cold weather, warm engine and transmission for 5 minutes by operating engine at half throttle.

NOTE: If engine fails to start, refer to "Trouble Shooting" charts.

COLD WEATHER STARTING AIDS

To assist in cold weather starting, several aids are available. These aids are effective at low temperatures only when the engine is otherwise operating satisfactorily. They will not correct such deficiencies as low battery charge, crankcase oil of too heavy viscosity, or high electrical resistance, any of which may prevent the engine from starting.

Auxiliary Batteries

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

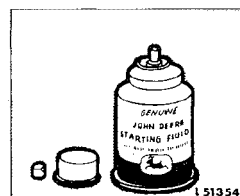
CAUTION: Gas given off by batteries is explosive. To avoid injury or battery damage, avoid sparks near the batteries.

Use jumper cables to connect the positive (+) terminal of the booster battery to the positive (+) terminal of the tractor batteries and the negative (-) terminal of the booster battery to a good ground on the tractor frame away from the battery. See your JOHN DEERE dealer for booster batteries.

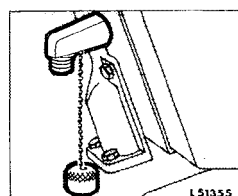
IMPORTANT: The batteries on your tractor are **NEGATIVE** grounded only. Reversed polarity in battery or alternator connections will result in damage to electrical system.

Diesel Starting Fluid Adapter

Your tractor is equipped with a starting fluid adapter. This attachment is used to inject atomized starting fluid into the engine air intake system when starting the engine at temperatures below +32°F (0°C).



To use starting fluid, remove the safety cap and plastic spray button from the can.



Remove cap from adapter.

Injecting Diesel Starting Fluid

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

Inject starting fluid only while engine is turning. Inject starting fluid intermittently, not continuously.



L 47897

Position can onto adapter and inject fluid by pushing up on can for a short period.

Relax pressure on the can between "shots" of fluid. Stop injecting fluid as soon as the engine starts. If engine begins to die during the first few minutes of operation, inject another "shot" of fluid. When the engine is running smoothly, remove the can from the adapter and replace the safety cap on the can. Be sure to put the cap back on the adapter when not in use. This prevents dust from being drawn into the engine.

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

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



R21111

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

ENGINE WARM-UP PERIOD

The engine must have attained the correct operating temperature before putting the unit under full load. To warm up the engine, run it for a few minutes with the hand throttle halfway open. Thus excessive wear on piston rings, cylinders and bearings is avoided.

ENGINE IDLING

Avoid unnecessary engine idling. Prolonged engine idling may cause the engine coolant temperature to drop below its normal range. This in turn causes crankcase oil dilution, due to incomplete fuel combustion, and permits formation of lacquer or gummy deposits on valves, pistons and piston rings. It also promotes rapid accumulation of engine sludge.

ENGINE SPEEDS

The engine working speed range is between 1400 and 2400 rpm. Within these limits the engine can be put under full load. Maximum continuous power is obtained at 2400 rpm.

Operate the engine at 2100 rpm to obtain SAE standard PTO speeds.

When using the PTO, set the hand throttle so that the engine speed pointer is even with the green mark on the speed-hour meter.

STOPPING THE ENGINE

Run the engine at 1400 rpm for a short time before shutting it off completely. This will allow the engine to cool off gradually.

To stop the engine, move switch key into the off or "O" position.

IMPORTANT: Never attempt to stop the engine by closing the shut-off valve at the fuel tank as this will cause the pump to run dry and damage internal parts.

CAUTION: Remove switch key to prevent accidents, tampering, and unauthorized operation. Removing the key also prevents the switch from being accidentally left in an on position and causing battery discharge.

PARKING THE MACHINE

Completely stop the tractor. Move the gear shift lever into any gear position. Then move the range shift lever to park (P) position.

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

TOWING THE TRACTOR

When towing the tractor, move both the gear and range shift levers to the neutral position. Thus you will avoid any unnecessary transmission wear.

CAUTION: Never tow the tractor at a speed greater than 15 miles per hour (25 km/h).

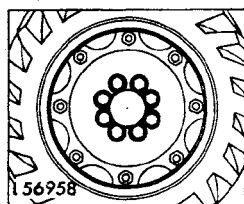
BREAK-IN PERIOD

After the first 4 hours and 8 hours of operation retighten all wheel retainers and front axle bolts. Check tightness of retainers and axle bolts frequently during the first 100 hours of operation.

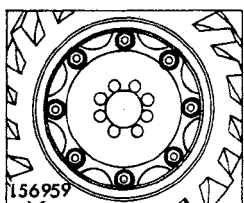
Thereafter check tightness of bolts and screws periodically.

Recommended torques are as follows:

Rear Wheels

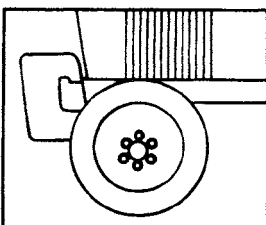


Wheel disk-to-axle flange
130 ft-lbs (18 mkg)



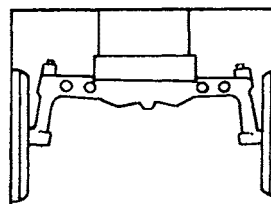
Rim-to-wheel disk 145 ft-lbs (20 mkg)

Front Wheels



Wheel-to-axle flange 87 ft-lbs (12 mkg)

Front Axle



Axle bolts 300 ft-lbs (41.5 mkg)

The tractor should be operated under normal load during the first 20 hours of operation.

IMPORTANT: Avoid light loads or excessive engine idling.

Ideal conditions for breaking in a tractor engine would require operating the tractor at full engine speed under 75% of full load. Under such operating conditions an engine would be broken in after approximately the first 100 hours.

In most cases, however, it is practically impossible to operate the tractor under these conditions during the first hours. This is the reason why, in many cases, the duration of the break-in period is considerably longer than 100 hours.

Under very light load conditions some engines may never break in which results in glazed cylinder liners.

During the break-in period a higher-than-usual oil consumption should be considered as normal.

Check periodically to be sure that an adequate supply of oil is maintained in the crankcase.

At the end of the first 50 hours of operation, replace the transmission system oil filter.

At the end of the first 100 hours of operation, drain and refill crankcase and replace filter element.

We recommend that you ask your JOHN DEERE dealer to carry out a general inspection of the tractor before the first 100 operating hours are completed.

SELECTING TRAVEL SPEEDS

The tractor has eight forward gears and four reverse gears. These gears, together with the engine speeds that may be selected, allow the operator to balance load and speed for maximum economy, and give him flexibility to meet varying work conditions. For example, for a given travel speed the operator may choose to work in a low gear at a high engine speed or in a higher gear at a lower engine speed.

Gears should be selected so as to avoid a permanent overloading of the engine.

HIGH SPEED DRIVING

A higher gear can be used when traveling on good, straight roads.

On bad, curvy roads or when working on slopes, it is necessary to shift to a lower gear and to reduce speed.



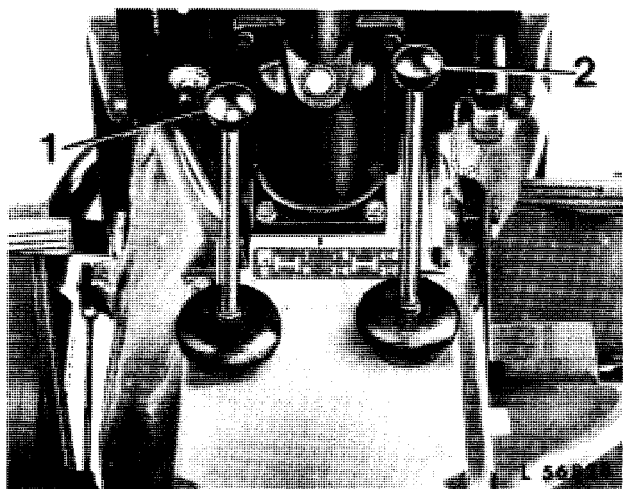
CAUTION: Fast driving causes many accidents. Couple the brake pedals together and always drive at a safe speed.

TRAVEL SPEEDS

Gear	13.6-28 Rear Tires				21.5L-16.1 Rear Tires			
	2100 rpm		2400 rpm		2100 rpm		2400 rpm	
	MPH	KM/H	MPH	KM/H	MPH	KM/H	MPH	KM/H
1st	1.1	1,8	1.3	2,0	0.9	1,4	1.0	1,6
2nd	1.6	2,5	1.8	2,9	1.3	2,1	1.5	2,3
3rd	2.3	3,7	2.7	4,3	1.9	3,0	2.2	3,5
4th	3.3	5,2	3.7	6,0	2.6	4,3	3.0	4,9
5th	4.3	6,9	4.9	7,9	3.5	5,6	4.0	6,4
6th	6.1	9,9	7.0	11,3	5.0	8,0	5.7	9,2
7th	9.1	14,7	10.4	16,8	7.4	11,9	8.5	13,6
8th	12.7	20,5	14.6	23,4	10.4	16,7	11.8	19,0
R1	1.3	2,1	1.5	2,3	1.0	1,7	1.2	1,9
R2	1.8	2,9	2.1	3,3	1.5	2,4	1.7	2,7
R3	2.7	4,3	3.1	5,0	2.2	3,5	2.5	4,0
R4	3.8	6,1	4.3	6,9	3.1	4,9	3.5	5,6

NOTE: If your tractor is equipped with 16.5L-16.1 rear tires, the ground speeds will be 25 percent slower than those shown for the 13.6-28 tires. If equipped with 12.4-28 tires, the ground speed will be 3 percent slower. If equipped with 16.9-24 tires, the ground speed will be 2 percent slower.

SHIFTING GEARS



- 1—Range shift lever (left-hand lever)
- 2—Gear shift lever (right-hand lever)

Gear shifting is controlled by a range shift lever and a gear shift lever.

With the range shift lever a low or high range of gears can be engaged.

Shift Pattern



Range Shift Lever Positions

Gear Shift Lever Positions

- I—Low range
- II—High range
- P—Park position
- R—Reverse range

Use range shift lever to engage park (P) position.

The gear shift lever can be used to select 1st, 2nd, 3rd, and 4th gears when the range shift lever is in low range position; it can be used to select 5th, 6th, 7th, and 8th gears when the range shift lever is in high range position. When the range shift lever is in reverse range, reverse gears comparable to 1st, 2nd, 3rd, and 4th can be obtained.

Shifting from Neutral

1. Depress clutch pedal.
2. Move range and gear shift levers in the position required.
3. Gradually release clutch pedal, however, do not allow clutch to slip longer than necessary to take up load smoothly.

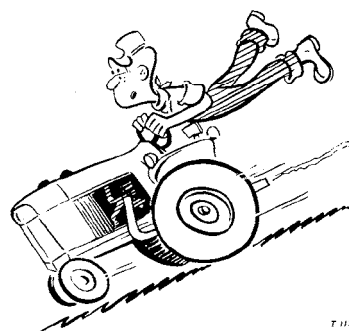
To shift “on the go” from lower to higher gear, increase engine speed, depress clutch, decrease engine speed, engage higher gear, release clutch slowly and increase engine speed.

To shift “on the go” from higher to lower gear, decrease engine speed, depress clutch pedal, place gear shift lever in neutral, release clutch momentarily, increase engine speed, declutch and select lower gear. Release clutch slowly.

Avoid gear clash when shifting “on the go”.

Shifting to Another Range

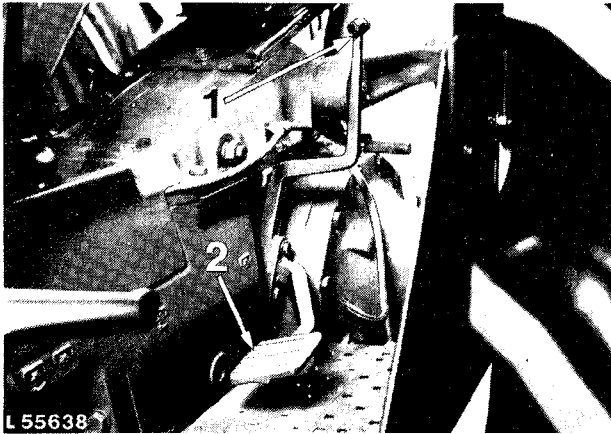
To shift to another range, fully stop the unit, disengage the clutch and then change gear range as required.



CAUTION: Do not allow tractor to coast downhill with clutch disengaged and transmission in gear. This will result in loss of control, in overspeeding, and damage to the clutch.

DIFFERENTIAL LOCK

With differential lock engaged, power is transferred equally to both rear wheels. This prevents the usual loss of traction when one wheel is slipping.



1—Hand lever
2—Pedal

To engage the differential lock, push out on the lever (or down on the pedal). Unequal traction will keep the lock engaged. You may have to hold the lever or pedal engaged if unequal traction is not continuous.

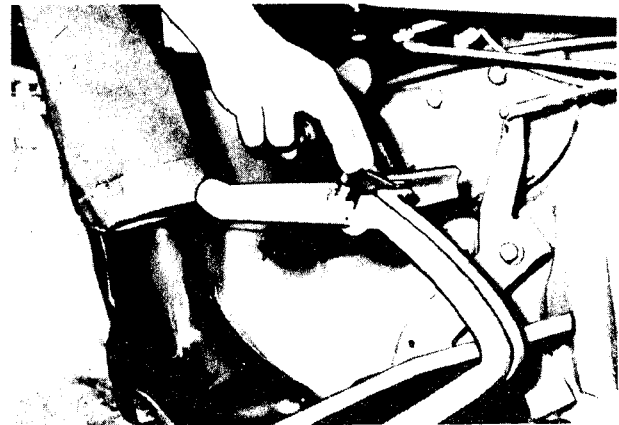
CAUTION: Do not operate the tractor at high speeds or attempt to turn the tractor with the differential lock engaged.

STEERING

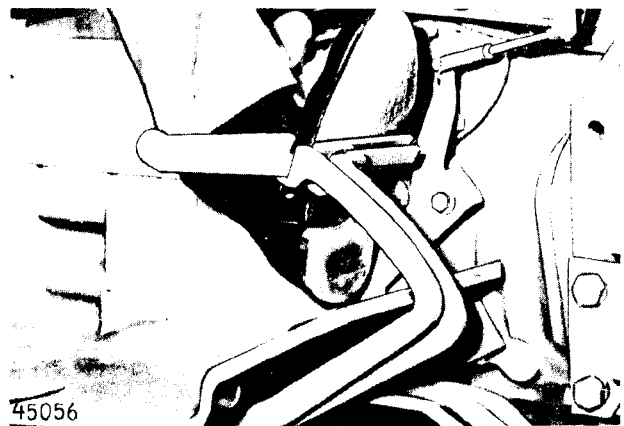
The tractor may be equipped with manual or power steering. Power steering makes steering and control of the tractor easier for the operator. In case of pressure failure, the tractor can be steered manually.

HYDRAULIC FOOT BRAKES

CAUTION: Brake pedals should be coupled together by means of pedal coupler when traveling at high speeds or when driving on public roads.



Coupling brake pedals together



Using foot brake to make a sharp left-hand turn

When turning the tractor, press down on a single brake pedal. Use the left pedal to turn left and the right pedal to turn right. When negotiating sharp turns, press brake pedal down more sharply as the steering wheel is being turned.

Use brake for steering purposes at low speed only.

When stopping the tractor, press down on both brake pedals.

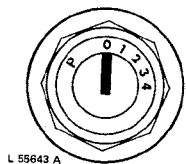
CAUTION: Your safety may depend on your tractor brakes. If they become defective, have them repaired right away.

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.

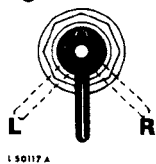
LIGHTS

Main Switch



L 55643 A

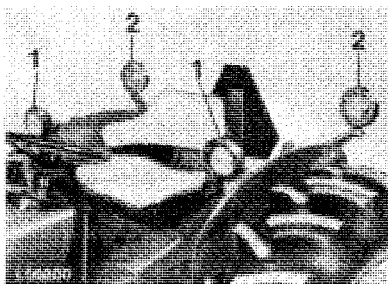
Light Switch



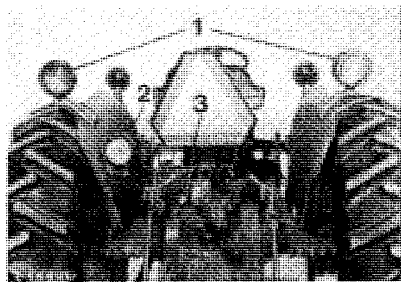
L 50117 A

Main Switch Position	Light Switch Position	Electrical Circuit Turned On
P	R	Dim headlights and rear work light
	L	Dim headlights, warning lamps, and taillight
O		Off
1		Ignition circuit (indicator lights, fuel gauge, and injection pump)
2	R	Dim headlights, rear work light, and ignition circuit
	L	Dim headlights, warning lamps, taillight, and ignition circuit
3	R	Bright headlights, rear work light, and ignition circuit
	L	Bright headlights, warning lamps, taillight, and ignition circuit
4	R	Dim headlights, rear work light, and ignition circuit
	L	Dim headlights, warning lamps, rear work light, and ignition circuit

Light switch position O turns off the warning lamps and, except for main switch position 4, the rear work light.



1—Headlights 2—Tractor warning lamps, front view



1—Tractor warning lamps, rear view 2—Rear work light and tail light 3—Electrical outlet socket

HIGHWAY DRIVING

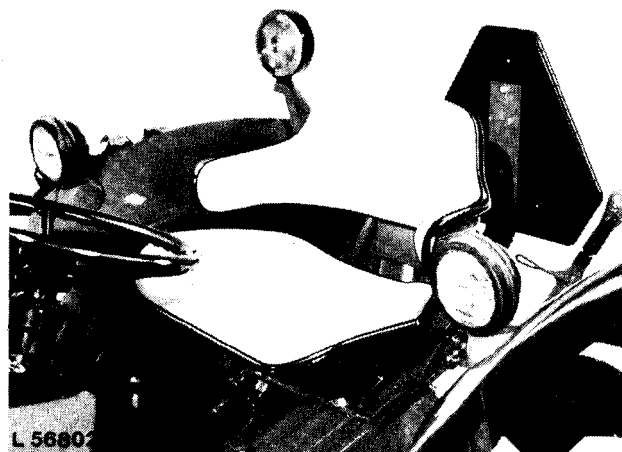
When transporting (or driving) the tractor on a road or highway at night or during the day, use accessory lights and devices for adequate warning to the operators of other vehicles. In this regard, check local governmental regulations. Various safety lights and devices are available from your John Deere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

When driving on the highway, use main switch position 2 or 3 with light switch in L position. 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.

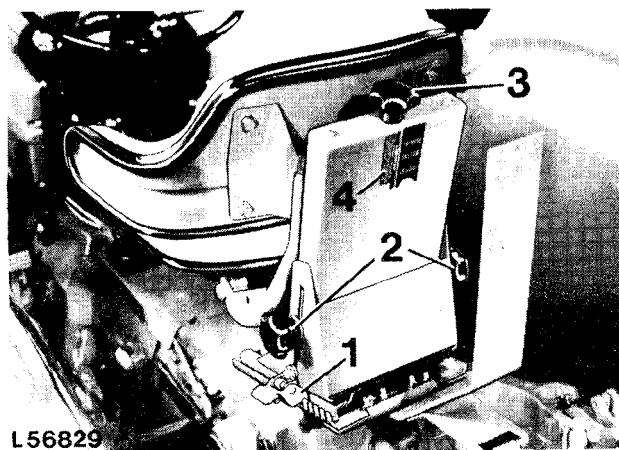
OPERATOR'S SEAT

Two seat types are available.



L 56802

The deluxe seat is adjustable for the operator's height and weight and folds back for standing.



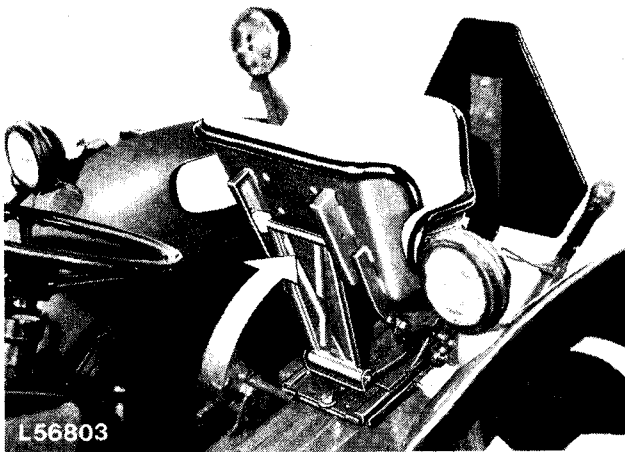
L 56829

1—Raise catch and adjust horizontally.

2—Loosen handwheels on both sides and adjust seat to desired height. Retighten both handwheels securely.

3—Handwheel for adjusting according to operator's weight.

4—Weight adjustment pattern.



The operator's seat can be folded back against the backrest to drive tractor while standing.

ROLL-GARD AND SEAT BELT

A protective Roll-Gard with seat belt is available for your tractor. A canopy that fits on top of the Roll-Gard is also available.

See pages 54 and 59 for additional information.



CAUTION: Under almost all operating conditions:

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

WHEEL TREADS

Adjustable Front Axle

With 5.50-16, 6.00-16, or 6.50-16 tires, the front axle tread may be adjusted from 49-5/8 to 74-1/4 inches. The tread may be further extended to 79-1/2 inches by reversing the wheel on the axle. With 23/10.5-12 tires, the tread may be adjusted from 49-1/2 to 66-1/4 inches. With 27/9.5-15 front tires and 21.5L-16.1 rear tires, the front axle tread may be adjusted from 46-1/4 to 63-1/4 inches. With 27/9.5-15 front tires and 16.9-24 rear tires, the front axle tread may be adjusted from 50-1/4 to 74-3/4 inches.

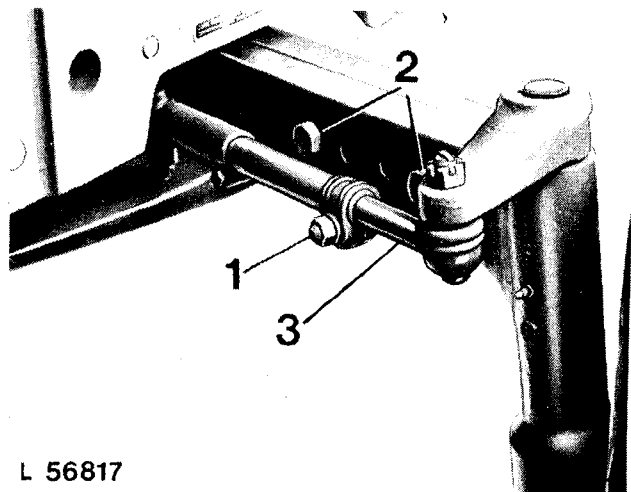
IMPORTANT: To avoid excessive stress on axle bolts, do not separate axle halves beyond the above limits.

Bolt spacing should be 4 in. in maximum tread width and 6 in. in all other tread widths.

Adjusting Front Wheel Tread

Jack up front end of tractor.

Do not place jack under engine oil pan.

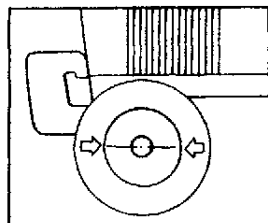


- 1 — Remove tie rod clamp bolts.
- 2 — Remove axle bolts and reposition axle ends to the desired front wheel tread. Insert axle bolts and tighten nuts to 300 ft. lb. torque.
- 3 — The tie rods have grooves to simplify adjustment. Adjust the same distance as the axles. Insert and tighten tie rod clamp bolts to 85 ft. lb.

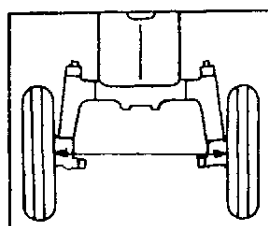
Check to see that front wheels turn equally to right and left. Check toe-in and adjust, if necessary.

Checking Front Wheel Toe-in

Check front wheel toe-in periodically with tractor on level ground and front wheels in straight-ahead position.



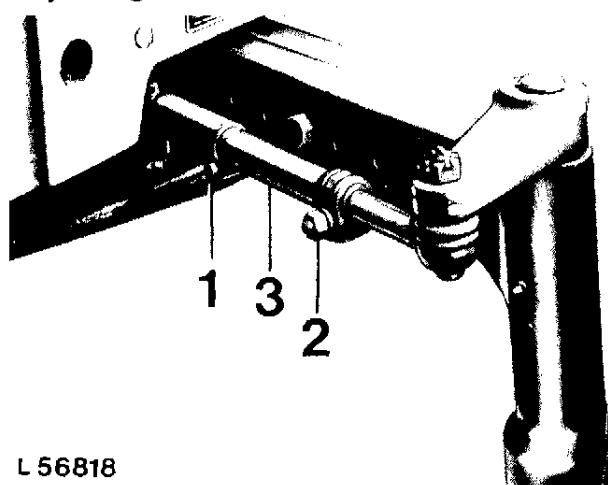
Front and rear of front wheels at hub height.



Measure from rim flange to rim flange.

Proper toe-in is 1/8 to 1/4 in. less in front than in rear.

Adjusting Front Wheel Toe-in



L 56818

- 1—Loosen inner clamping bolt.
- 2—Remove outer clamping bolt.
- 3—Turn tie-rod tube in or out.

Turn tie-rod in to shorten and turn out to increase amount of toe-in.

Turn each tie-rod an equal amount so that front wheels remain in straight-ahead position.

After toe-in adjustment is completed, tighten inner clamping bolts to 36 ft-lbs torque. Insert and tighten outer clamping bolts to 85 ft-lbs torque.

Periodically check the tightness of the front wheel retainer cap screws. They should be tightened to 85 ft-lbs torque.

REAR WHEEL TREADS

Demountable Rim Wheels

Rear wheel tread can be adjusted by re-positioning or reversing the rims or by reversing the wheel disks.

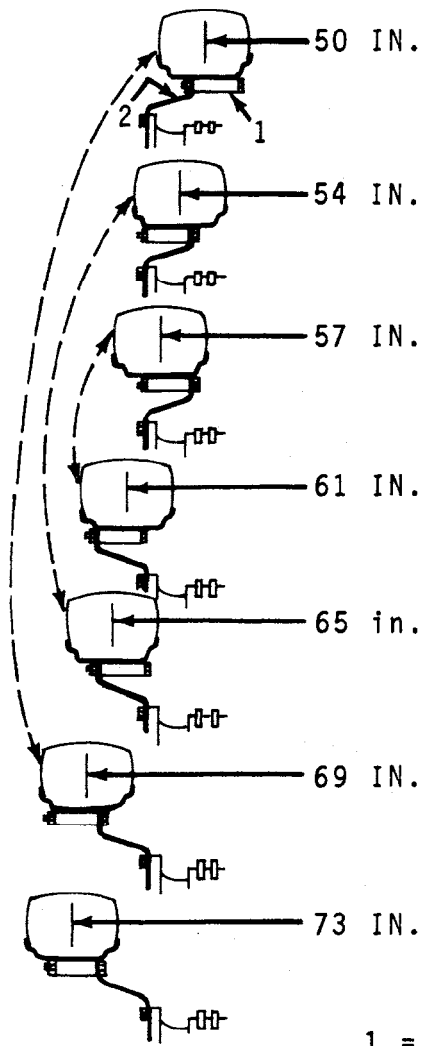
Rear wheel tread can also be adjusted by reversing the complete wheels. When reversing the wheels, they must be changed from one side to the other so that the arrow on side wall of tire points in the direction of forward rotation of tire.

After adjustment has been completed, tighten inner attaching screws (wheel to axle) to 130 ft-lbs torque.

The outer attaching screws (rim to disk) must be tightened to 145 ft-lbs torque.

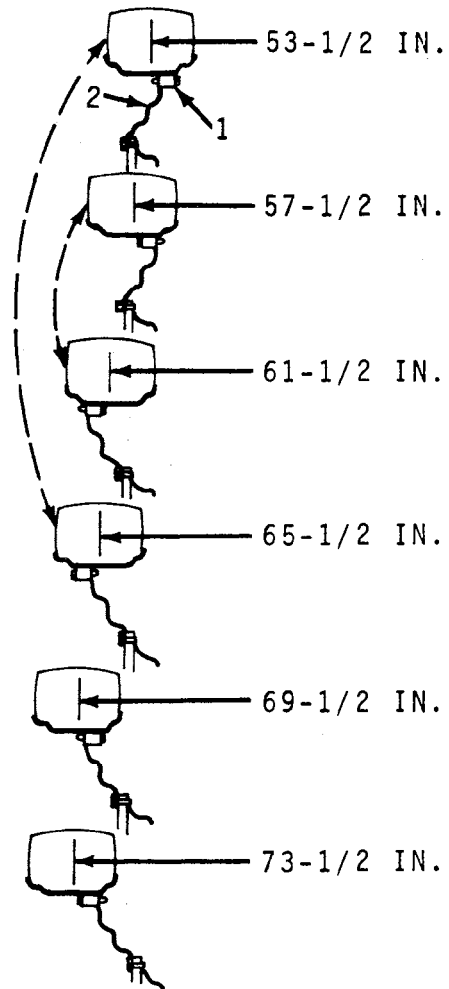
The relationship of the rear wheel disk and rim in obtaining the different tread settings is shown in the following drawings. A study of these drawings before attempting to change tread settings will save time and unnecessary labor.

12-4-28 OR
13-6-28 TIRES



R21086

16-9-24 TIRES



1 = BRACKET

2 = WHEEL DISK

If tractor is equipped with rear wheel spacers, add 8 inches to the tread given in the illustration.

Steel Disk Wheels

Tractors with 16.5L-16.1 rear tires on steel disk rear wheels have rear wheel treads of 52 inches or 67

inches. With 21.5L-16.1 rear tires, the rear wheel treads are 57 inches or 62 inches. Tighten the wheel disk-to-axle bolts evenly to 130 ft-lbs torque.

If tractor is equipped with rear wheel spacers, add 8 inches to the above treads.



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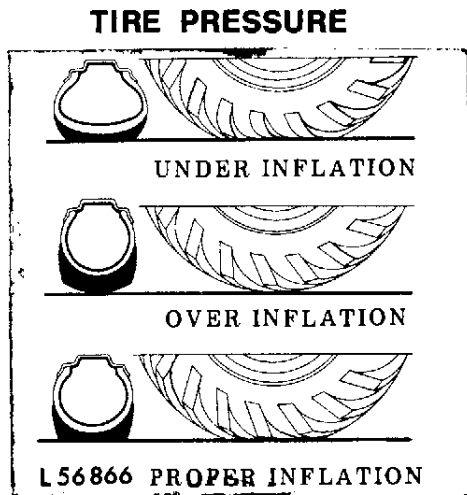
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DIRECTION OF TIRE ROTATION

When mounting or changing tires, make sure arrow on sidewall of tires points in the direction of forward rotation.



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, increase wheel slippage and wear.

INFLATION CHARTS

Front Tires Inflation Pressure

Tire Size	Ply Rating	With Towed or Rear-Mounted Implement	With Max. Ballast or Front-Mounted Implement
5.50-16	4	32 psi.	36 psi.
6.00-16	4	24 psi.	32 psi.
6.00-16	6	36 psi.	48 psi.
6.50-16	4	24 psi.	32 psi.
23/10.5-12	4	18 psi	Not Recommended
27/9.5-15	4	25 psi.	25 psi.

Rear Tires

Inflation Pressure

Tire Size	Ply Rating	With Little or No Added Ballast	With Max. Ballast or Heavy Rear-Mounted Implement
12.4-28	4	14 psi.	14 psi.
12.4-28	6	14 psi.	14 psi.
13.6-28	4	14 psi.	14 psi.
16.5L-16.1	6	20 psi.	Not Recommended
16.9-24	6	16 psi.	16 psi.
21.5L-16.1	6	12 psi.	12 psi.

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