8020
DIESEL TRACTOR

JOHN DEERE

OPERATORS MANUAL

8020
DIESEL TRACTOR

OMR37261 B4 English

JOHN DEERE TRACTOR WORKS
OMR37261 B4

LITHO IN THE U.S.A.
ENGLISH

TO THE PURCHASER

Your new John Deere 8020 Tractor is a powerful, versatile, heavyweight performer. Built to the traditionally high standards of John Deere, this tractor will handle large-capacity tools in the toughest field conditions at high speed and with unequalled economy. Added to the tractor's tremendous capacity for work are such modern features as four-wheel drive, power steering, air brakes, heavy-duty hydraulic clutch, "on the go" gear shifting within ranges, and oscillating front and rear sections which enable the tractor to cross over rough ground and cling to hillsides with great stability. New operating ease and comfort, hydraulic power when and where you need it, the ability to match engine power and transmission speed to any job, outstanding dependability, and simplicity of lubrication and service are all in this great new tractor.

When used with equally advanced John Deere tools and implements, your 8020 will deliver all the power you need for better, easier, and more profitable farming.

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

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

Your John Deere dealer wants to help you get the most value from your new tractor. His skilled servicemen can handle every job efficiently. These men are trained in modern service methods and have all necessary tools and equipment.

When in need of parts, be prepared to furnish your dealer with the serial number of the tractor and the serial number of the engine or other component for which parts are required. This information will help the dealer give you quick, efficient service.

The tractor serial number plate is located on the left-hand side of the front section (bogie). The serial number of the engine is located on the right-hand side of the valve rocker arm cover. Serial numbers of other components are prominently displayed.

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SPECIFICATIONS

POWER
- Engine horsepower .... More than 200 h.p.
- Drawbar pull ..... Approx. 22,000 lbs.

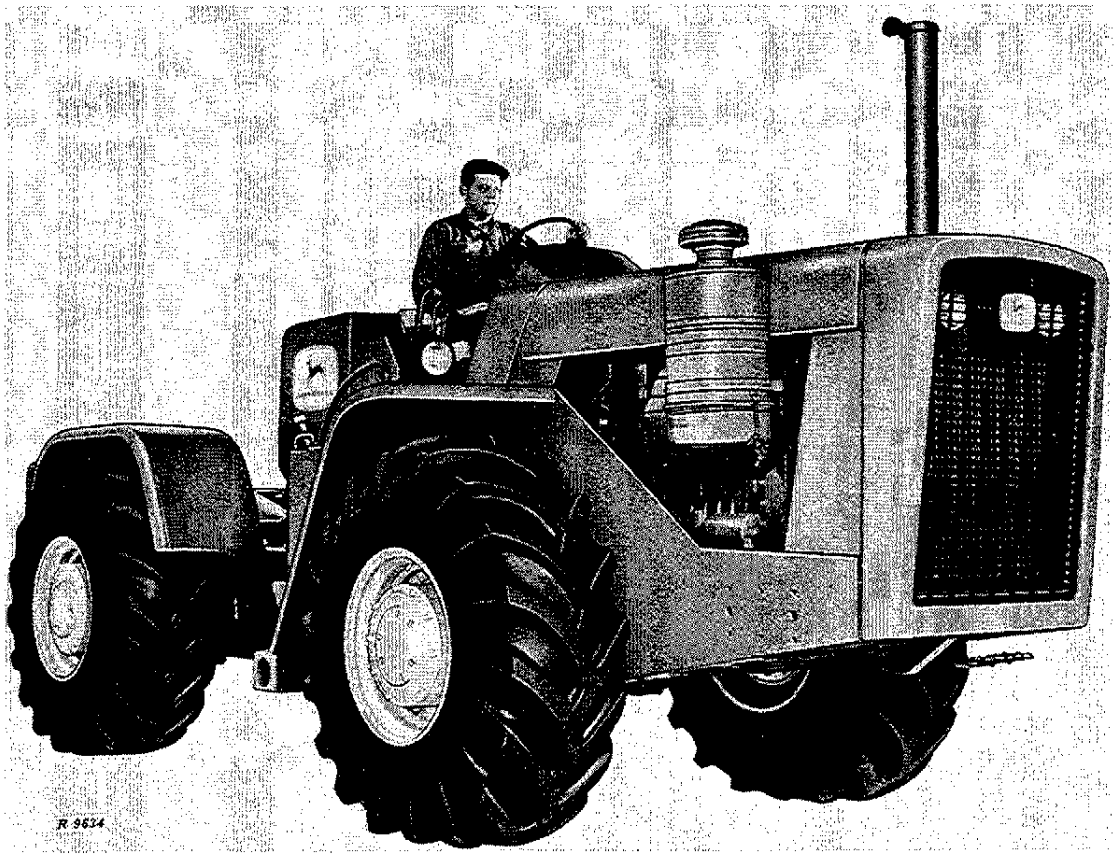
SPEEDS
- 1st ..... 2-7/8 mph
- 2nd ..... 3-7/8 mph
- 3rd ..... 5 mph
- 4th ..... 6-1/3 mph
- 5th ..... 8-1/8 mph
- 6th ..... 11 mph
- 7th ..... 14 mph
- 8th ..... 18 mph
- Low reverse ..... 1-7/8 mph
- High reverse ..... 5-5/8 mph

ENGINE ..... GM 2-cycle, 6-cylinder
- Bore ..... 4.25 in.
- Stroke ..... 5.00 in.
- Displacement ..... 425 cu. in.
- Compression ratio ..... 17 to 1
- Rated speed ..... 2100 rpm

CAPACITIES (U.S. MEASUREMENTS)
- Fuel tank ..... 106 gals.
- Hydraulic system ..... 25 gals.
- Cooling system ..... 12 gals.
- Crankcase ..... 4.5 gals.
- Clutch-transmission oil reservoir ..... 15 gals.
- Axle housing and planetary ..... 7 gals.
- Oil bath air cleaner ..... 1.6 gals.

FUEL SYSTEM . .Recirculating bleed type with full-flow strainer and filter

ELECTRICAL SYSTEM
- Starting ..... 24 volts
- Lights and accessories ..... 12 volts



John Deere 8020 Diesel Tractor, Right-Hand Side View

LUBRICATION SYSTEM
- Type . . . . . Full pressure, force feed
- Filters . . . . . One full-flow, one bypass

COOLING SYSTEM . . . . Bypass, pressure type

TRANSMISSION
- Type . . . . . Pressure lubricated syncro-mesh, 2-range
- Speeds . . . . . 8 forward, 2 reverse

CLUTCH . . . . . Heavy-duty, oil cooled, hydraulic clutch

STEERING . . . Fully hydraulic power steering

BRAKES
- Type . . . . . 4 drums with internal expanding shoes
- Operated by . . . . . Compressed air
- Parking brake . . . . . Mechanical

DRIVE AXLES . . . . Heavy-duty with planetary reduction

HYDRAULIC SYSTEM . . . 40 or 60-gpm pump with flow divider to control rate of oil flow. Choice of either two or three selective control valves to control double-acting remote cylinders. 3-point hitch available.

TIRE SIZES . . . . . 23.1/18-26, 12-ply, or 18.00 x 25, 20-ply

DIMENSIONS
- Height to top of steering wheel . . 8 ft. 3 in.
- Height to top of exhaust pipe . 9 ft. 4-1/2 in.
- Width over tires . . . . . 96 in.
- Wheelbase . . . . . 120 in.
- Length (grille to drawbar) . . . . 19 ft. 10 in.
- Turning radius . . . . . 17 ft. 6 in.

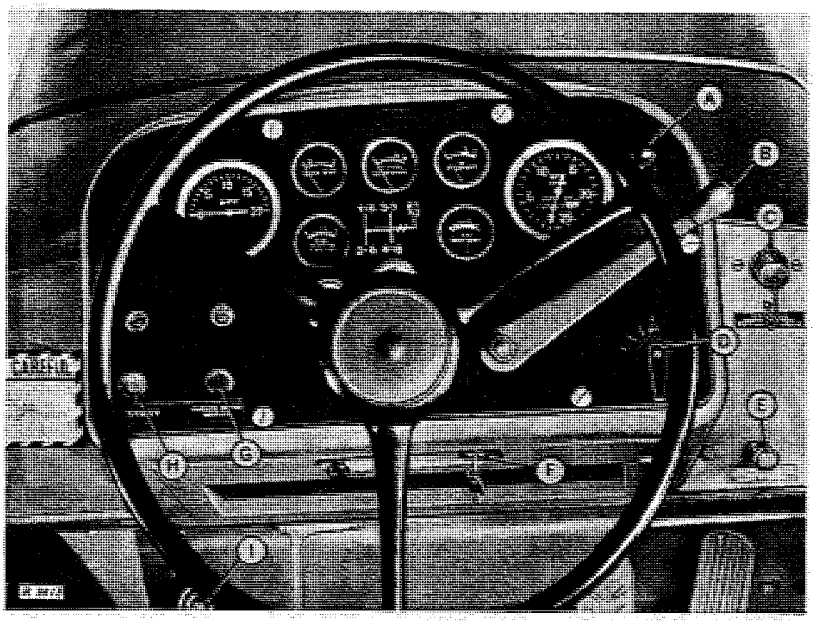
WEIGHT
- Front only (without liquid ballast) . . . . . 13,700 lbs. (67%)
- Rear only (without liquid ballast) . . . . . 6,750 lbs. (33%)
- Total without liquid ballast . . . . 20,450 lbs.
- Total with liquid ballast . . . . . 26,450 lbs.

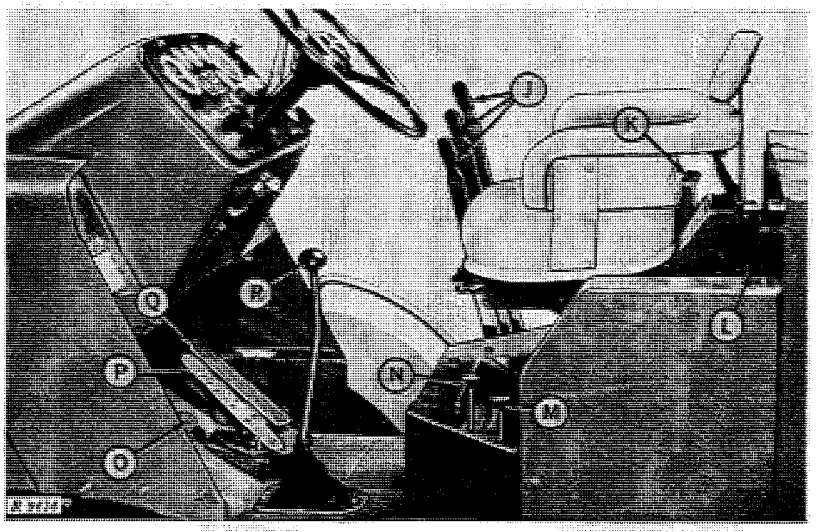
John Deere 8020 Diesel Tractor, Left-Hand Side View

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. Complete information concerning the use of the controls and instruments is given in "Operation."

CONTROLS





A – Engine Stop Knob
B – Hand Throttle
C – Cold Weather Starting Aid
D – Light Switch
E – Engine Emergency Shutoff Knob
F – Key Switch
G – Parking Brake Release Knob
H – Starter Button
I – Parking Brake Pedal
J – Hydraulic System Operating Levers
K – Transmission Gear Range Selector Lever
L – Seat Position Selector Lever
M – Hydraulic Pump Disconnect Knob
N – Front Axle Drive Disconnect Knob
O – Clutch Pedal
P – Brake Pedal
Q – Foot Throttle
R – Shift Lever

A. ENGINE STOP KNOB

The engine is normally stopped by pulling out on this knob.

B. HAND THROTTLE

The hand throttle controls engine speed. Pulling the lever down increases engine speed; pushing it up decreases engine speed to slow idle.

C. COLD WEATHER STARTING AID

The capped tube located on the right-hand cowl panel insert leads to the engine air intake system. During cold weather, starting fluid is sprayed into this tube to help start the engine.

D. LIGHT SWITCH

The light switch is used to turn on the lights.

E. ENGINE EMERGENCY SHUTOFF KNOB

In rare instances, it may be impossible to stop the engine in the routine manner. In this case, the engine can be stopped by pulling out on the handle located on the right-hand cowl panel. This knob should be used ONLY in an emergency.

F. KEY SWITCH

This switch controls the electrical system of the tractor. The electrical equipment on the tractor will not operate until the key switch is turned on.

G. PARKING BRAKE RELEASE KNOB

The parking brake is released by pulling this knob.

H. STARTER BUTTON

Pushing the starter button, after the key switch has been turned on, activates the starter to start the engine.

I. PARKING BRAKE PEDAL

The mechanically operated parking brake is activated by this pedal at the extreme left-hand side of the platform. When depressed, the pedal applies the brake and automatically locks it.

J. HYDRAULIC SYSTEM OPERATING LEVERS

These levers control the tractor hydraulic system. The tractor may be equipped with two or three levers, depending on the hydraulic equipment.

K. TRANSMISSION GEAR RANGE SELECTOR LEVER

The transmission may be operated in either of two gear ranges (high or low) to obtain the various tractor speeds. The desired gear range is controlled by this lever. When the lever is in the rear position, the transmission is in low range. When the lever is in the forward position, the transmission is in high range.

L. SEAT POSITION SELECTOR LEVER

This lever adjusts the position of the seat to suit the height of the operator. To make this adjustment, first move the seat to the upper rear position. Then move the seat position selector lever between "short" and "tall" until the pedals and levers can be operated comfortably when the operator is seated. The seat will always return to this position when the operator sits down, after having moved the seat up and to the rear.

M. HYDRAULIC PUMP DISCONNECT KNOB

The hydraulic pump is engaged by pushing down on the rear knob at the left-hand corner of the seat support. The pump should be engaged ONLY when the engine is stopped.

N. FRONT AXLE DRIVE DISCONNECT KNOB

Pulling up on the front knob at the left-hand corner of the seat support disengages the front axle drive when four-wheel drive is unnecessary or when the tractor is traveling on the highway. Pushing the knob down engages the front axle drive.

O. CLUTCH PEDAL

Depressing the clutch pedal disengages the hydraulic clutch to permit shifting of the gears.

P. BRAKE PEDAL

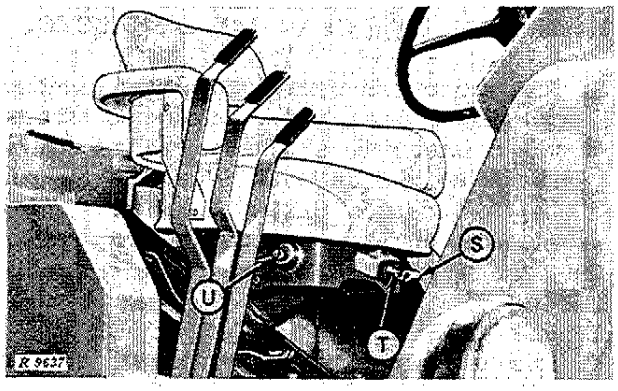
This pedal activates the four air brakes. Braking effort is proportional to pedal travel.

Q. FOOT THROTTLE

Engine speed may be increased beyond the hand throttle setting by depressing the foot throttle. When foot pressure is removed from the pedal, engine speed reverts to the speed determined by the position of the hand throttle.

R. SHIFT LEVER

The transmission is shifted through its eight forward speeds and two reverse speeds by means of the shift lever.



S – Seat Weight Adjusting Screw
T – Seat Latch Handle
U – Seat Counterbalance Shaft

S. SEAT WEIGHT ADJUSTING SCREW

Turn the adjusting screw until the indicator on the left-hand side at the front of the seat conforms to your weight.

T. SEAT RELEASE LATCH

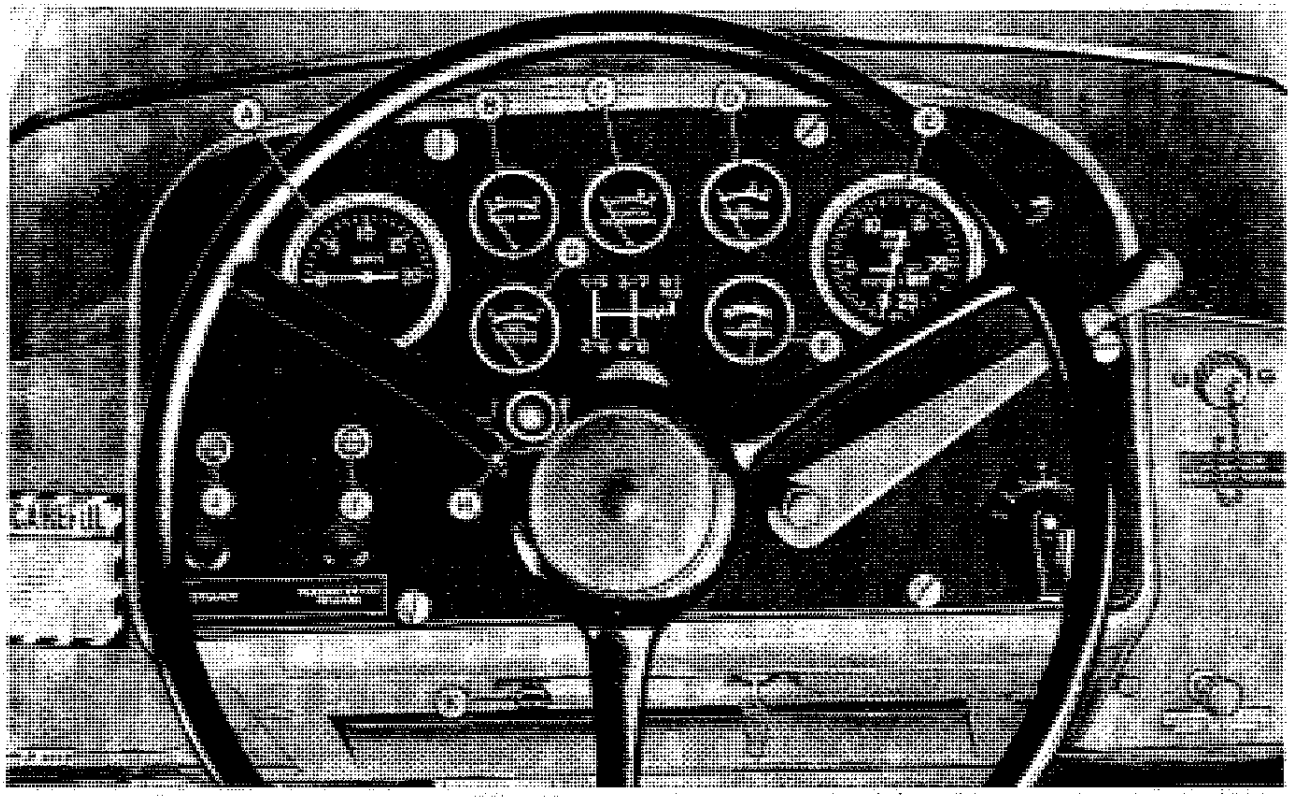
To move the seat up and back (to provide more room for mounting or dismounting) stand up and lift the seat release latch. Sit down to return the seat to the normal, preset operating position.

U. SEAT COUNTERBALANCE SHAFT

If the seat does not move fully to the rear when unlatched, turn the counterbalance shaft to adjust the counterbalance spring. To do so, move the seat rearward. Then insert a screwdriver in the counterbalance shaft slot, push in to unlatch the shaft, and turn the shaft counter-clockwise. Align the latch with one of the pairs of slots in the side of the seat support and pull the screwdriver outward to latch the shaft.

INSTRUMENTS

All instruments are conveniently grouped on the instrument panel where they may be observed at a glance by the operator.



A – Speedometer
B – Water Temperature Gauge
C – Clutch Oil Pressure Gauge
D – Engine Oil Pressure Gauge
E – Tachometer and Hour Meter
F – Air Pressure Gauge
G – Fuel Gauge
H – Low Air and Engine Oil Pressure Warning Light
I – Parking Brake Indicator Light
J – Generator Indicator Light
K – Cigarette Lighter

A. SPEEDOMETER

This instrument gives the tractor speed in miles per hour.

B. WATER TEMPERATURE GAUGE

This gauge indicates the temperature of the coolant in the engine cooling system. During operation, the indicator hand should remain in the "N" (normal) range.

C. CLUTCH OIL PRESSURE GAUGE

This gauge shows the pressure of the oil in the hydraulic clutch. When the clutch pedal is depressed, the oil pressure will fall to zero. If clutch oil pressure drops during tractor operation, stop the tractor immediately to avoid damage.

D. ENGINE OIL PRESSURE GAUGE

This gauge shows whether or not the engine oil pump is operating satisfactorily. It does not reveal the condition or amount of oil in the crankcase. If the indicator hand does not register pressure, the warning lamp on the instrument panel will flash on and off. In such a case, stop the engine immediately and determine the cause.

E. TACHOMETER AND HOUR METER

The accumulated hours of engine service, measured in hours and tenths of hours, are shown by the hour meter. Engine revolutions per minute are also indicated.

F. AIR PRESSURE GAUGE

This gauge shows the amount of pressure in the air brake reservoir. The indicator should be in the "N" (normal) range when the tractor is operating. If the hand drops into the "DANGER" range, indicating that the air pressure is less than 30 pounds per square inch, the warning lamp on the instrument panel will flash on and off. In such a case, stop the tractor as soon as possible to determine the cause.

G. FUEL GAUGE

This electrically-operated gauge indicates the amount of fuel in the tank. The gauge will not operate until the key switch is turned on.

H. LOW AIR AND ENGINE OIL PRESSURE WARNING LIGHT

Should either the air pressure or the engine oil pressure drop below safe levels, this warning light will flash on and off. A glance at the gauges will tell which pressure is low. The tractor should be stopped at once and the cause of the low pressure determined. This light will flash momentarily whenever the engine is started.

I. PARKING BRAKE INDICATOR LIGHT

When the parking brake is applied, this lamp glows red if the key switch is turned on. It serves as a reminder to release the brake before operating the tractor.

J. GENERATOR INDICATOR LIGHT

With the key switch on, this lamp glows red if the generator fails to charge. The lamp goes out when the generator is rotating fast enough to force a charge into the batteries.

K. CIGARETTE LIGHTER

The tractor is equipped with a cigarette lighter located on the recessed panel below the instrument panel.

OPERATION

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

OPERATING THE ENGINE

STARTING THE ENGINE

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

(a) Check the engine crankcase oil level.
(b) Service the air cleaner.
(c) Check the radiator coolant level.
(d) Drain 1/4 pint of fuel from the fuel strainer (page 36).
(e) Fill the fuel tank.

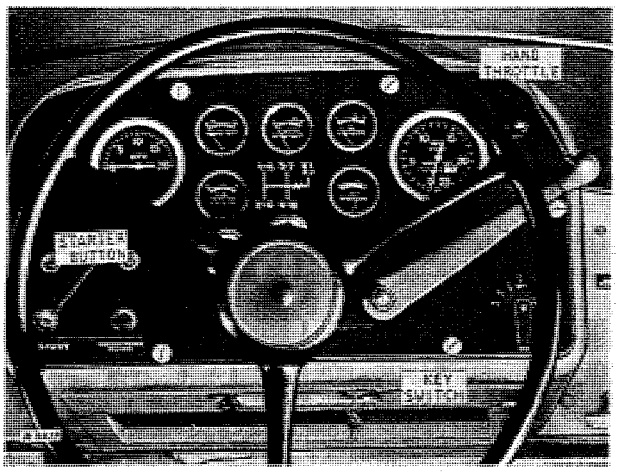
(2) Make sure the fuel shutoff valve on the bottom of the fuel tank is open.

(3) Place the shift lever in neutral and depress the clutch pedal to decrease drag on the engine. During cold weather, disengage the hydraulic pump by pulling up on the hydraulic pump disconnect knob.

(4) Pull the hand throttle down to full-open position to set the injector racks and insure delivery of fuel to the injectors. Then move the throttle back to idle position (as far up as it will go).

(5) Turn the key switch to the right to its "on" position. Push the starter button to engage the starter. Do not hold the starter button for more than 30 seconds at a time. To do so may overheat the starter. If the engine does not start the first time, wait for a minute or so before trying again. This will give the starter a chance to cool. If the engine fails to start after four such attempts, refer to "Trouble Shooting."

NOTE: If the prevailing temperature is 40 degrees Fahrenheit or lower, it may be neces-



Hand Throttle, Key Switch, and Starter Button

If the push button is released before the engine starts, wait until the starter stops before pushing the button again. This will prevent the possibility of damage to the starter.

(6) Watch the engine oil pressure gauge as the engine begins to run. If the indicator hand is not in the "N" (normal) range, stop the engine immediately and determine the cause.

Make sure the generator indicator red light goes out as the engine picks up speed. If the light continues to glow, stop the engine and determine the cause.

(7) After the engine starts, use the hand throttle or foot throttle to bring it to operating speed. Be sure the engine is warmed up before placing it under full load.

CAUTION: Always leave key switch on while the engine is running so the indicator lights will

COLD WEATHER STARTING

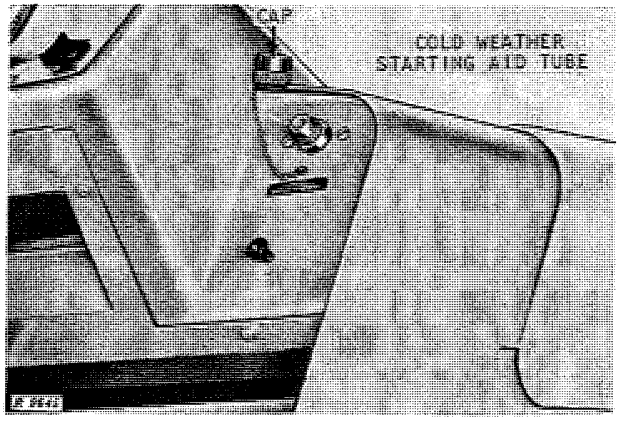
When the air temperature is extremely cold, the heat of compression in the engine combustion chamber may not be high enough to ignite the injected fuel.

If the outside temperature is 40 degrees Fahrenheit or lower, an engine starting aid may be necessary. The need for such a starting aid depends to some extent on the type of fuel used and the condition of the engine. A starting aid will not correct such deficiencies as low battery charge, crankcase oil of heavy viscosity, or high electrical resistance. Starting aids are intended for use only when the air is too cold for heat of compression to ignite the fuel-air mixture and the engine is otherwise operating satisfactorily.

Pressurized push-button cans containing starting fluid, which aids fuel combustion, can be obtained from your John Deere dealer.

To start the engine in cold weather, remove the cap from the cold weather starting aid inlet tube on the right-hand cowl insert panel.

Follow steps 1 through 5 for normal starting. While attempting to start the engine (step 5), spray starting fluid into the inlet tube until the engine starts.



Cold Weather Starting Aid

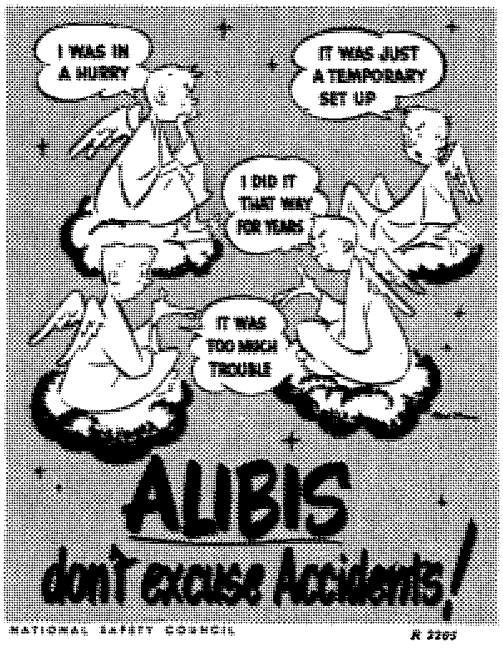
CAUTION: Ether starting fluid is highly flammable.

During extremely cold weather, it may be necessary to continue spraying fluid for a short time after the engine starts to keep it running. However, avoid using an excessive amount of fluid. Too many "shots" of starting fluid may cause pre-ignition or flooding, either of which could damage the engine or starter.

After the engine is running satisfactorily, replace the cap on the starting aid inlet tube. This will prevent entrance of unfiltered air into the engine.

Do not spray fluid into the air cleaner intake as instructed on some starting fluid cans. Fluid drawn through the oil in the air cleaner loses much of its effectiveness. This practice can also result in getting too much fluid in the cylinders, especially when the air is extremely cold.

After engine is started, follow steps 6 and 7 on page 8.



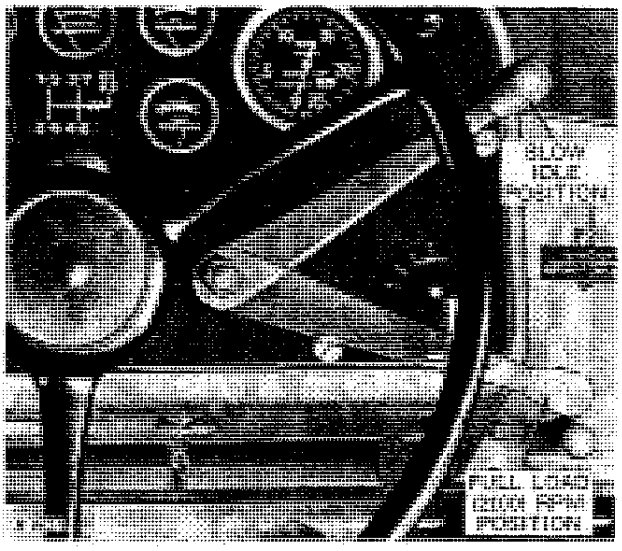
ENGINE SPEEDS

OPERATING SPEEDS

It is important for economy and best performance to operate the engine at full throttle whenever possible (2100 rpm). Correct fast idle (full open but no load) speed is 2230 to 2270 rpm, and correct slow idle speed is 550 to 600 rpm. The engine is designed to operate at these speeds. High fuel consumption, excessive smoke from the exhaust, and increased maintenance costs will result from operating the engine above the specified speeds. SUCH PRACTICE WILL ALSO VOID THE ENGINE WARRANTY.

USING HAND THROTTLE

Use the hand throttle to select slow idle or full load (2100 rpm) engine speed.



Hand Throttle Positions

Push the lever upward as far as it will go to obtain slow idle. Pull the lever downward as far as it will go to obtain full load engine speed.

It is always best to set the hand throttle in full load position and vary the tractor ground speed by shifting gears.

USING FOOT THROTTLE

Depress the foot throttle only when conditions are such that it is more practical to speed up the tractor by this method than it would be to shift gears.

When the pedal is pressed downward as far as it will go, the engine is operating at full throttle. When the pedal is released, engine speed reverts to that established by the setting of the hand throttle.

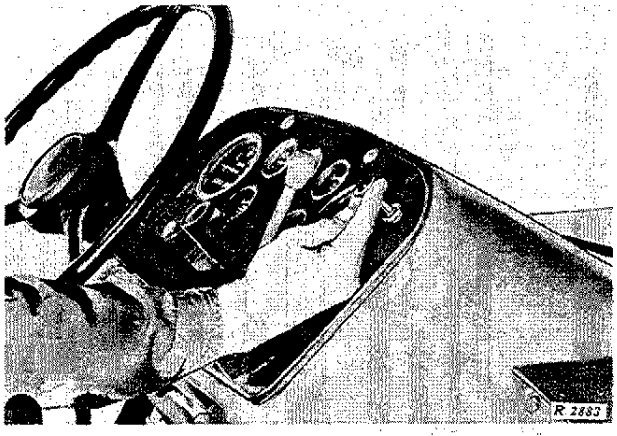
ENGINE IDLING

Avoid unnecessary engine idling. Prolonged idling may cause the engine coolant to fall below the specified range of 160° to 185° F. Low operating temperature causes crankcase dilution due to incomplete fuel combustion and permits the formation of lacquer or gummy deposits on valves, pistons, and rings. It also promotes a rapid accumulation of sludge within the engine. When the tractor is to remain idle for any length of time, stop the engine.

STOPPING THE ENGINE

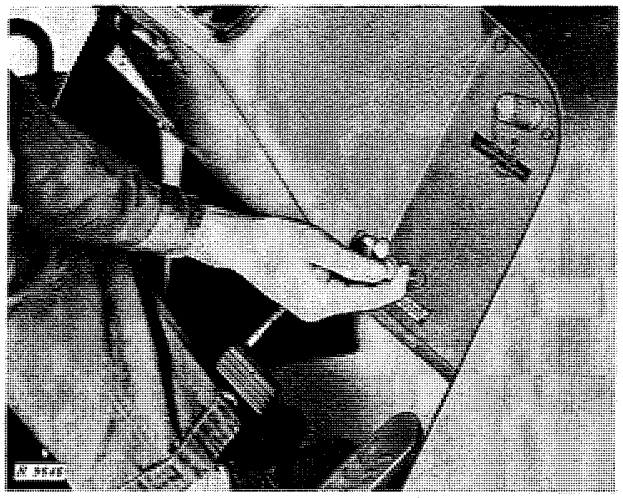
ROUTINE STOPPING

Allow the engine to idle for a minute or so at half speed or lower, without load, before stopping it. This permits the engine to cool gradually. Sudden cooling of a hot engine may cause metal parts to contract unevenly and subject them to rapid wear.



Pulling Out Engine Stop Knob

With the hand throttle at slow idle, pull out the engine stop knob. After a few revolutions, the engine will stop. Pulling out on the stop knob shuts off the supply of fuel to the injectors.



Pulling Out Emergency Engine Shutoff Knob

Turn the key switch off to prevent battery discharge through the generator indicator light and fuel gauge. Remove the key from the key switch to prevent tampering and unauthorized operation of the engine and electrical accessories. Apply the parking brake to hold the tractor stationary.

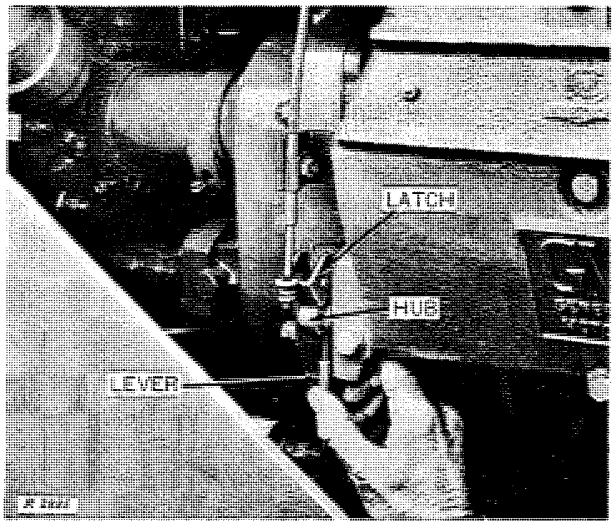
EMERGENCY ENGINE STOPPING

In rare instances, it may be impossible to stop the engine in the routine manner due to unusual wear or damage to the engine stopping mechanism. If this occurs, pull out on the engine emergency shutoff knob. This stops the engine by shutting off the engine air supply.

After the emergency shutoff is used, reset the mechanism. To do so, push the knob in as far as it will go. Then push down and inward on the lever at the engine end of the mechanism to engage the latch on the cable end with the hub of the operating shaft.

Before starting the engine, determine why it would not stop in the normal manner and correct the cause.

Use the emergency shutoff only in a case of emergency. Stopping the engine by this method may cause oil to be sucked past the oil seals into the blower housing. Damage to the engine may also result.



Resetting Emergency Engine Shutoff Mechanism

BREAKING IN THE ENGINE

Operate your new tractor for the first 20 hours at 1/2 to 3/4 load. After this 20-hour period, the tractor is then ready for full load service. At no time should the tractor be operated under full load until it has run long enough for the engine and crankcase oil to warm up thoroughly.

At the end of the first 100-hour period, drain the crankcase oil, service the oil filters, and fill the crankcase with diesel engine oil as specified in this manual.

WARM-UP PERIOD

Before placing the tractor under full load, be sure it is warmed up to the proper operating temperature.

A good practice is to idle the engine at about half speed for 5 minutes and then operate it at fast idle for the same length of time before applying a load.

When starting to work with a cold engine, it is best to operate for about 30 minutes in a lower gear than is normally required for the load. This will give the oil a chance to circulate freely and will prevent undue wear on engine and transmission parts.

DRIVING THE TRACTOR

PRELIMINARY CHECKS

After the engine is started and warmed up, glance at the instruments to make sure everything is operating properly. The generator indicator light should be off and the oil pressure, temperature, and air pressure gauge indicator hands in the "N" (normal) range.

The combination low air and/or low engine oil pressure warning lamp will flash whenever the key switch is turned on. It will remain flashing momentarily after the engine is started until the respective pressures are built up.

SHIFTING GEARS

SELECTING PROPER SPEED

The tractor has 8 forward speeds and 2 reverse speeds which enable the operator to balance load and speed for maximum economy and provide flexibility of speed to meet varying working conditions.

The transmission has two speed ranges, low and high, controlled by the transmission range selector lever at the right-hand side of the seat. Moving the lever rearward provides low range transmission speeds (1-2-3-4-low Rev.); moving the lever forward provides high range speeds (5-6-7-8-high Rev.)

Before making range shifts the tractor motion MUST BE STOPPED and the clutch disengaged. Do not engage the clutch until the shift is completed. Range shifts are best accomplished at 1000 to 1200 engine rpm., rather than idle speeds.

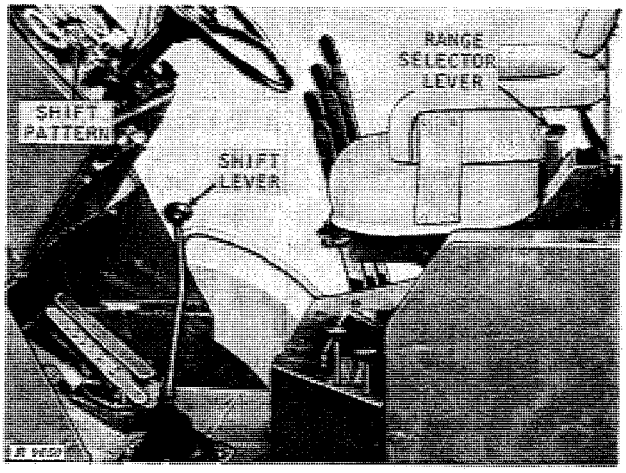
The range shift must be either completely forward or completely rearward before the tractor will move.

In the event gear clashing occurs during a shift, wait momentarily before moving the lever after the clutch is disengaged to allow the clutch drum to stop rotating. If gears do not engage, but no clash is evident, turning the steering wheel back and forth will rotate the gears enough to allow engagement.

When the engine is operating at full load speed (2100 rpm), the ground speeds at which the tractor will travel are:

TRACTOR GROUND SPEEDS

Low range	
1st	2-7/8 mph
2nd	3-7/8 mph
3rd	5 mph
4th	6-1/3 mph
Reverse 1	1-7/8 mph
High range	
5th	8-1/8 mph
6th	11 mph
7th	14 mph
8th	18 mph
Reverse 2	5-5/8 mph



Shift Pattern, Shift Lever, and Range Selector Lever

Each position of the shift lever in the quadrant provides a different speed in each range. In high range, the position used for 1st in low range is used for 5th, the one used for 2nd is used for 6th, the one for 3rd is used for 7th, the one for 4th is used for 8th, and the one for reverse 1 is used for reverse 2.

Releasing Parking Brake

Select the proper gear for the work to be done. For best performance and maximum economy, it is good practice to operate the engine at full rated load speed whenever possible, using the transmission gears to change the speed of travel. If the load is light and you want to travel at slow speed, it is better to use the gear that gives the desired speed than to use a faster gear and throttle down. A tractor traveling slowly in a high gear with a light load and a retarded throttle is wasting fuel. On the other hand, if the selected gear is too high for the load, the overloaded engine will "lug" or labor, which increases engine wear.

SHIFTING FROM NEUTRAL

Having selected the proper gear, depress the clutch pedal and move the transmission gear range selector lever in position to obtain high or low range (lever forward for high, rearward for low).

Depress the clutch pedal and move the shift lever to the gear which gives the desired speed.

Release the parking brake by pulling up on the knob on the instrument panel. Then release the clutch pedal to take up the load smoothly.

SHIFTING FROM ONE SPEED TO ANOTHER

All gears except reverse and high and low range are synchronized, making it possible to shift while the tractor is in motion. To shift from one speed to another in the same speed range, depress the clutch pedal and shift in the usual manner. Use caution when shifting down from a high speed to a low speed.

NOTE: Always shift the transmission into a forward speed before shifting into reverse speed. This stops countershaft rotation and prevents clashing.

To shift from one speed range to the other, disengage the clutch, stop the tractor and move the range selector lever to the new position.

STEERING

Hydraulic power provides effortless, positive steering and eliminates wheel tug and ground shock. The system includes a hydraulic cylinder mounted between the two hinged front and rear sections (or "bogies") of the tractor.

Turning the steering wheel directs hydraulic oil under pressure to either end of the cylinder to extend or retract the piston. Piston motion causes the bogies to hinge and turn the tractor. When the operator stops turning the steering wheel, the tractor will remain in the same degree of turn established when steering wheel motion was discontinued. This is because a "follow-up" mechanism cuts off flow of oil to the steering cylinder when steering wheel motion is stopped. When the steering wheel is returned to neutral, the tractor continues straight ahead in the new direction.

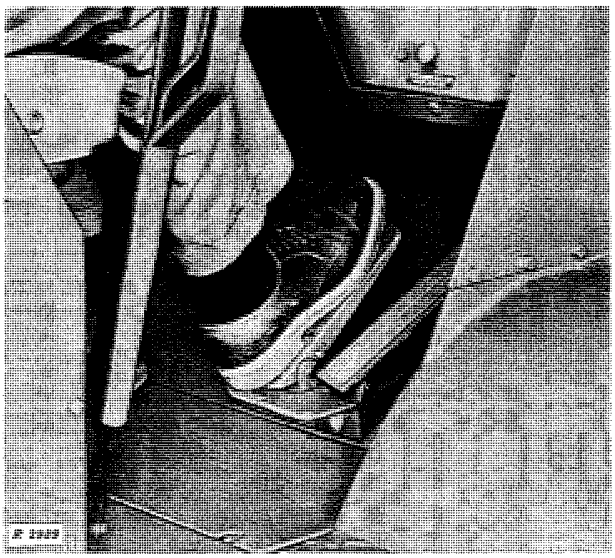
USING AIR BRAKES

Operation of the air brakes differs very little from operation of conventional brakes. The distance the brake pedal is depressed determines the amount of air delivered to the brake-actuating mechanism and the resultant braking force.

Never operate the tractor until the indicator hand on the air pressure gauge is in the "N" (normal) range. If the hand drops into the "DANGER" range, indicating a pressure of 30 pounds per square inch or less, there is not sufficient pressure to operate the brakes effectively. The warning lamp on instrument panel will flash as a warning to the operator.

To use the brakes to best advantage, apply them at first as hard as speed and ground conditions permit, and gradually release them as tractor speed decreases. When the stop is completed, there should be only sufficient compressed air in the actuating mechanism to hold the tractor stationary. Never "fan" the brake pedal. To do so merely wastes compressed air and does not improve the stop.

NOTE: Normally there is sufficient compressed air in the reservoir to make several stops after the engine is stopped. Therefore, except in an emergency, the air brakes should NEVER be operated unless the engine is running.



Operating Air Brakes

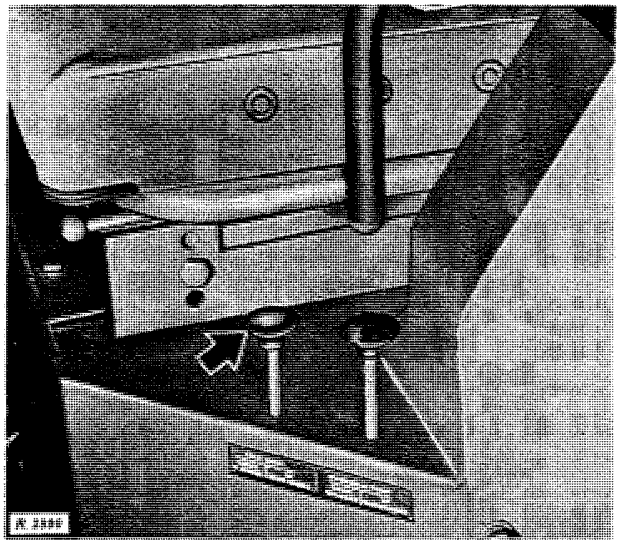
USING PARKING BRAKE

To apply the parking brake, depress the pedal at the left-hand side of the platform. The brake will lock automatically in the applied position.

To release the brake, pull up on the parking brake release knob on the instrument panel.

Always apply the parking brake when the engine is stopped. Since the clutch is held in engagement by hydraulic pressure, when the engine is stopped there is no hydraulic pressure and the clutch is disengaged. Therefore, placing the transmission in gear will not keep the tractor from rolling on an incline.

DRIVING WITH FRONT AXLE DISCONNECTED



Front Axle Drive Disconnect Knob

When four-wheel drive is unnecessary, or when traveling on the highway, the front axle should be disconnected from the engine. To do so stop the tractor, depress the clutch pedal, and place the tractor in gear. While pulling up on the front axle drive disconnect knob, release the clutch pedal and alternately speed up and slow down the tractor by means of the hand or foot throttle until the mechanism disengages.

To engage the front axle, place the tractor in gear and drive slowly forward and rearward while pushing down on the disconnect knob until the mechanism engages. Steering back and forth may also assist shifting to four-wheel drive.

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It is always advisable to disconnect the front axle when driving the tractor on a highway. Since there is usually some difference in rolling radius between the front and rear tires, due to such variable factors as tire pressure, tire wear, and weight of implements, the front and rear wheels may rotate at slightly different speeds. This will scuff the tires and subject them to rapid wear if the tractor is operated with four-wheel drive on the highway.

OVERLOADING THE TRACTOR

The tractor will handle economically and efficiently all jobs for which it was designed. Using the tractor on loads beyond its power range places excessive strain on all its parts and will eventually result in unnecessary repair expense and impaired operating efficiency. An overloaded tractor can usually be detected by a gradual slowing down in ground speed and a laboring engine. Black or gray smoke from the exhaust due to unburned fuel is also an indication of an overloaded engine.

HIGH SPEED DRIVING

The purpose of the high speed gears in the tractor is to save time when traveling on highways or on smooth-surfaced roads. Regardless of road or field conditions, use care when operating the tractor at high speed. Fast driving is the cause of many accidents. As a safety measure, shift to a lower gear when operating over rough ground. Disconnect the front axle drive for all high speed road travel.