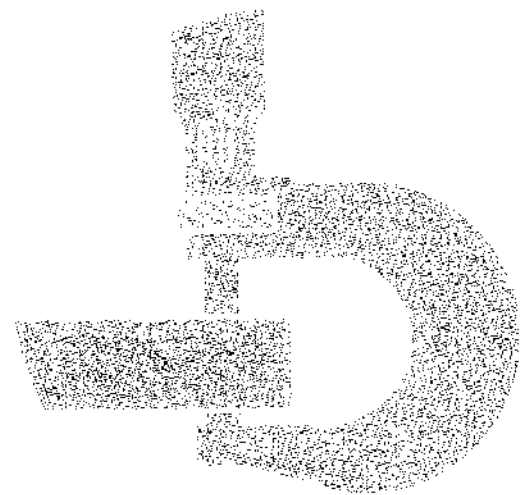


**John Deere  
JD760  
Tractor**



**SERVICE MANUAL**

**John Deere Dubuque Works  
SM-2075 (Jun-67)**



## SERVICE MANUAL

# JOHN DEERE JD760 TRACTOR

## CONTENTS

	Section
Description and Operation . . . . .	10
Specifications . . . . .	20
Periodic Services . . . . .	30
Engine Tune-Up and Tractor Adjustments . . . . .	40
Preliminary Procedure for Major Service . . . . .	50
Basic Engine. . . . .	60
Engine Lubrication System . . . . .	70
Cooling System . . . . .	80
Fuel System . . . . .	90
Transmission Clutch . . . . .	100
Syncro-Range Transmission . . . . .	110
Differential. . . . .	120
Final Drive. . . . .	130
Power Take-Off (PTO) . . . . .	140
Electrical System . . . . .	150
Seat. . . . .	160
Front Axle . . . . .	170
Wheels, Tires, and Weights. . . . .	180
Hydraulic System. . . . .	190
Hydraulic Pumps . . . . .	200
Power Steering . . . . .	210
Power Brakes. . . . .	220
Selective Control Valves . . . . .	230
Drawbar Assembly. . . . .	240
Trouble Shooting . . . . .	250
Special Service Tools. . . . .	260

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## TO THE JOHN DEERE SERVICEMAN

This service manual contains maintenance instructions for John Deere JD760 Tractors. Included are complete instructions for removal, disassembly, inspection, repair, assembly and installation of the major parts and assemblies of the tractor.

In addition, the manual contains brief descriptions of the more complicated systems of the tractor, and tells how they operate.

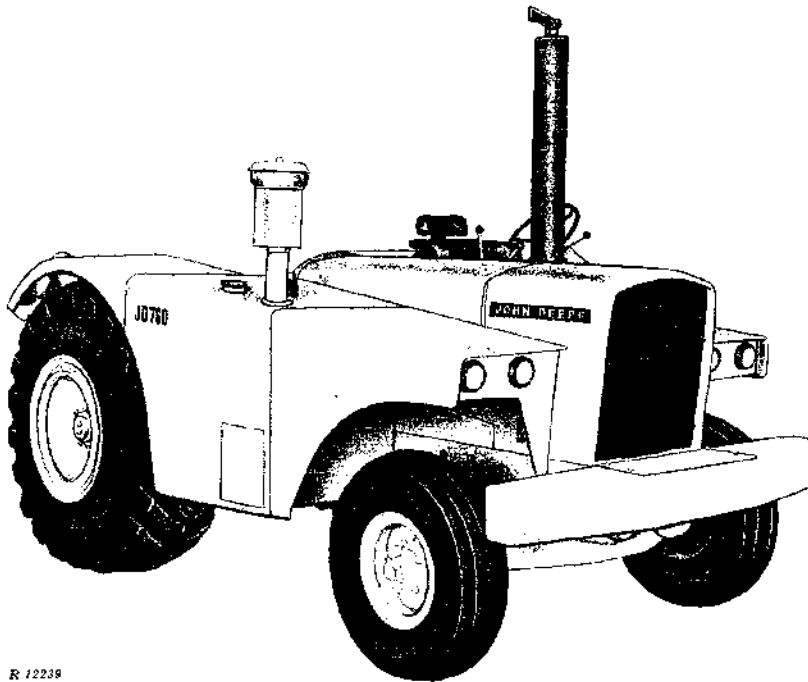
In Section 20, "Specifications," dimensions of many new wearing parts are given as an aid in determining when parts replacement is necessary. Section 260, "Special Service Tools," describes the tools necessary for proper servicing of JD760 Tractors.

Section 40, "Tune-Up and Adjustment," contains instructions for performing the services necessary to help the tractor perform efficiently

and economically after it has been in the field for some time.

This manual was planned and written for the Service Department; its place is in the shop. Use the manual whenever in doubt about correct maintenance procedures. Use it as a text book for training new Service Department personnel who are unfamiliar with John Deere Tractors.

Daily use of the service manual as a guide for any and all service problems will reduce error and costly delay to a minimum and assure you the best in finished service work. In many instances your customer's confidence in your work will be improved when he sees you using the service manual. He knows you are following approved maintenance procedures and making proper adjustments. There is no guesswork when you use the manual.



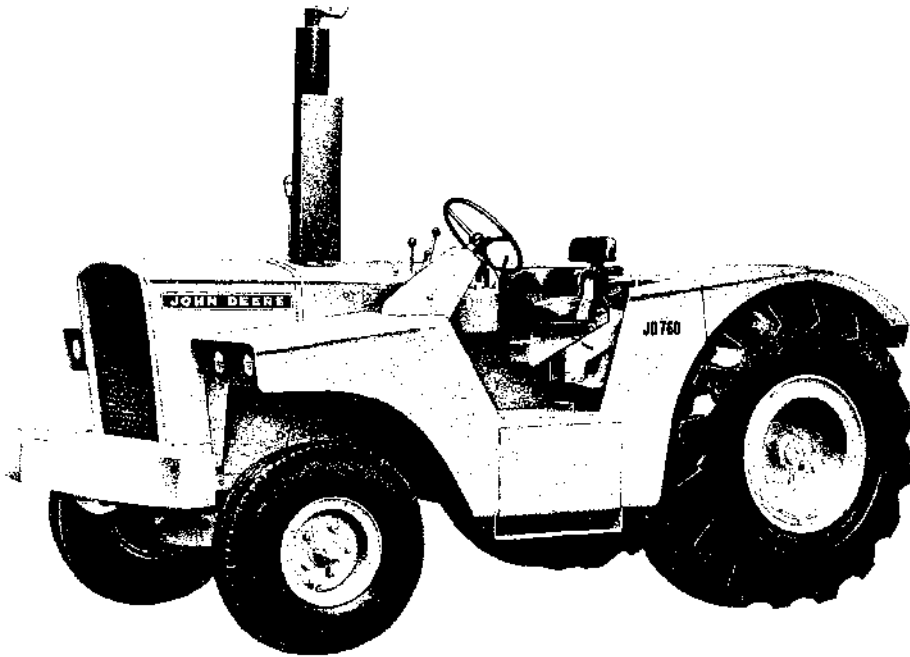
R 12239

*John Deere JD760 Tractor*



# Section 10 DESCRIPTION AND OPERATION

## Group 5 DESCRIPTION



R 6250

Fig. 10-5-1—John Deere JD760 Tractor

### INTRODUCTION

The John Deere JD760 Tractor is designed to operate heavy industrial equipment.

The tractor is the prime mover for the John Deere JD760 Scraper, a rugged, compact, efficient dirt-moving unit.

The operator's station is at the side of the tractor, a convenient position for better observation of the work being performed.

The tractor is equipped with a powerful John Deere engine developing 143 net engine flywheel horsepower.

The features of the tractor are described briefly in the paragraphs which follow. Full descriptions of each of the components are given in the various sections throughout this manual.

### SERIAL NUMBERS

Each engine is identified by a serial number located on the right hand side of the cylinder block immediately behind the alternator. The engine serial numbers given in this manual are the numerical serial numbers indicated in the following example:

SNM33RO 012000 R

*Numerical Serial Number*

The tractor serial number is located at the rear center of the transmission case. The tractor serial numbers given in this manual are the numerical serial numbers indicated in the following example:

SNT373R    012000    R

*Numerical Serial Number*

*NOTE: When ordering engine or tractor parts, record all the digits in the serial number.*

For brevity, when serial numbers are given in this manual any zeros which appear before the first significant digit are omitted.

### MODEL NUMBERS

The fuel injection pump, main hydraulic pump, selective control valve housings, and alternator each bear a model number.

### ENGINE

The tractor is powered by a variable-speed, full diesel engine. The engine develops up to 143 net engine flywheel horsepower at 2200 rpm.

The engine is a six-cylinder in-line four-stroke cycle engine. The cylinder liners are the wet sleeve type and the crankshaft bearings are the precision insert type.

Lubrication system has a full-flow filter with a replaceable element. The engine oil cooler is designed to cool the oil to a safe operating temperature.

A liquid-seal impeller type crankcase ventilating pump draws clean air from the air cleaner and circulates it through the engine for crankcase ventilation.

### COOLING SYSTEM

The pressure type cooling system has a centrifugal pump to provide continuous circulation of engine coolant. Proper engine temperature is maintained by two thermostats in the upper water manifold.

When the thermostats are closed, the system is designed to permit circulation of the coolant through the engine without passing through the radiator. This feature results in the engine

reaching operating temperature in a shorter length of time. When the engine reaches operating temperature, the thermostats open to control the flow of coolant through the radiator to maintain a constant operating temperature.

### FUEL SYSTEM

A 72 U.S. gallon fuel tank is an integral part of the fuel tank housing at the right side of the tractor just ahead of the rear wheel.

A fuel pump driven by the camshaft assures a constant supply of fuel to the injection pump.

Two replaceable micronic filtering elements are connected between the fuel pump and the injection pump and filters the diesel fuel before it enters the injection pump.

Fuel is injected by a distributor-type solid injection pump through high-pressure nozzles into the cylinders. A common pipe connected to each nozzle returns leak-off fuel from the nozzles to the fuel tank.

### ELECTRICAL SYSTEM

The tractor is equipped with a 24-volt alternator with regulator to furnish current for the electrical load and to maintain charges in four 6-volt batteries, connected in series.

This system is of the conventional grounded type, using negative grounded circuits.

A 24-volt starting motor with a coaxial, solenoid-shifted drive pinion is used to crank the engine.

Lighting circuits are 24-volt with two 12-volt loads in series in each circuit. All lamps are in pairs with exception of the tractor red tail lamp which is in series with a resistor. Current at 12 volts is furnished for the accessory circuit by two of the four 6-volt tractor batteries.

### CLUTCH ASSEMBLIES

The heavy-duty, two-plate, spring-loaded, transmission clutch is located in a recess at rear of the engine flywheel. It is operated by a pedal (hydraulically assisted) located to the left of the operator's platform. The clutch-operating cylinder is connected to an accumulator which supplies energy to operate the clutch, should the engine be stopped or hydraulic pressure fail.

The PTO clutch is of the multiple wet-disk type and is hydraulically actuated. It is operated by a lever to right of operator.

### TRANSMISSION

The Syncro-Range transmission, which contains constant-mesh, helical-cut gears, has four shift ranges. Three of the ranges have low, high, and reverse gears. The fourth range has low and high gears only. Thus, eight forward gears and three reverse gears are provided. Shifting is accomplished by means of two levers located to the left and forward of the instrument panel. The left-hand lever is used to select the desired range. The right-hand lever is used to select high, low, or reverse gear within the range.

The high, low, and reverse gear shifting is synchronized and can be accomplished while the tractor is moving.

While the shift between ranges is of the collar shift type and is normally accomplished with the tractor stopped, it can be accomplished while the tractor is on the move by proper use of the "double clutching" technique.

### DIFFERENTIAL AND FINAL DRIVE

A conventional spiral bevel ring gear and pinion drive is used in the tractor. A planetary gear assembly provides the final gear reduction in the drive gear train. This design reduces strain on the gear train.

A lock located in the differential assembly, enables the operator to lock the differential. This causes both rear wheels to turn at the same speed, moving the tractor under conditions where one drive wheel has lost its traction.

### POWER TAKE-OFF (PTO)

The tractor can be furnished with a right-angle, vertical PTO for use with the elevating scraper. At 2200 engine rpm, the vertical PTO operates at 1128 rpm.

The tractor can be obtained with a 1000-rpm horizontal PTO. At 1900 engine rpm, the horizontal PTO operates at 1010 rpm.

### DRAWBAR

The tractor is equipped with a heavy-duty fixed drawbar for attaching towed equipment.

### FRONT AXLE

The tractor is equipped with a heavy-duty, fixed tread front axle. The front wheels are truck-type rims bolted to hubs mounted on tapered roller bearings.

Front wheel tread is 69-1/4 inches.

### REAR WHEELS

Heavy-duty rear wheels are attached to the rear axles with no provision for tread width adjustment.

Rear wheel tread is 72 inches.

### SEAT

The tractor is regularly equipped with a deluxe suspension seat. This seat contains a steel compression spring and a shock absorber to provide "Float Ride" suspension.

The seat has a flexibly-mounted, padded back rest and semi-circular foam padding which surrounds the back of the operator.

### HYDRAULIC SYSTEM

The tractor hydraulic system is pressurized by a constant-running, variable displacement, hydraulic pump. The pump is mounted below and ahead of the radiator. It is driven at engine speed by the engine crankshaft. The hydraulic pump supplies oil under pressure to operate the power steering, power brakes, transmission clutch, differential lock, up to three remote hydraulic cylinders (if so equipped) or, the brakes and operating cylinders of trailing equipment.

The hydraulic system is constant pressure, closed center, and "live"; that is, it operates when the engine is running, whether the tractor is moving or not.

### STEERING

Hydraulic power steering is regular equipment on the tractor. Movement of the steering wheel actuates a steering valve which directs a flow of pressure oil to two steering cylinders which turn the front wheels. Should the hydraulic system lose pressure, the tractor can be steered manually.

### POWER BRAKES

The power brakes are operated by pedals located at the right side of the operator's platform. The brakes can be applied independently or simultaneously. The brake pedals can be locked together for simultaneous operation if desired. The hydraulically actuated, disk type brakes operate in oil.

*NOTE: The tractor brake pedals should always be locked together when operating the rock wagon or scraper unit except when it is necessary to use individual braking to make extremely short turns.*

On scraper units, the scraper power brakes are operated by a lever located at the left of the steering column, just under the steering wheel. On tractors with Athey Rock Wagons, this lever is the brake selector lever and controls the operation of the rock wagon brakes.

**CAUTION: Always apply the scraper brakes first when stopping the unit. Then, if necessary, use tractor brakes to assist. Using tractor brakes alone can be dangerous due to possible jackknifing of the unit.**

A brake accumulator, charged with dry nitrogen at 500 psi pressure, is connected to the brake systems and transmission clutch operating cylinder.

The accumulator stores energy for operation of brakes and clutch for several applications after the engine is stopped or if the main hydraulic pump should fail.

Units with the selective control valve levers running crosswise to the tractor also have a hydraulic oil accumulator that is connected to the selective control valve circuits. The hydraulic oil accumulator is also charged with dry nitrogen at 500 psi pressure.

## Group 10 OPERATION

### STARTING CONTROLS

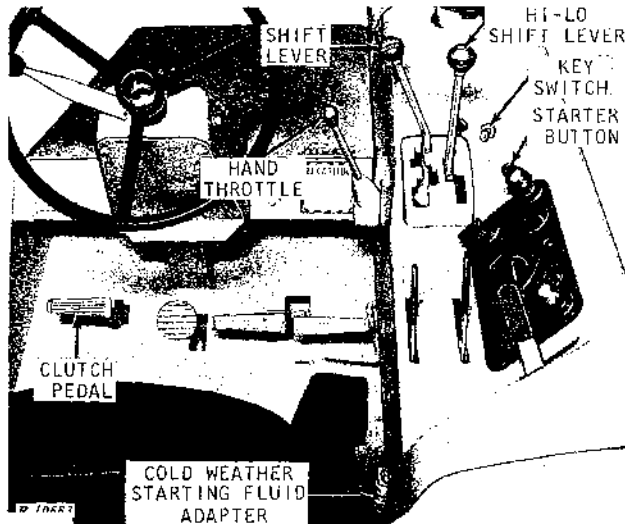


Fig. 10-10-1—Engine Starting Controls

Figure 10-10-1 illustrates the starting controls for the engine.

### PRE-STARTING INSPECTION

1. Check the engine crankcase oil level.
2. Check the radiator coolant level.
3. Check radiator hose and connections for leaks.
4. Make sure the fuel shut-off valve for the fuel tank is open.
5. Visually inspect tractor and tires for any irregularities which might affect operation.

### STARTING THE ENGINE

1. Place the Hi-Lo (right-hand) gearshift lever in neutral (N) position.
2. Move hand throttle lever to a position 1/3 of the way forward.
3. Turn key switch to the on position. The oil pressure indicator lamp should light. If it does not, turn the key switch off and determine the cause. See Section 150.
4. At temperatures below 40° F. use the cold-weather starting fluid adapter (page 10-10-2) and other cold weather starting aids as required.

5. Press the starter button to crank the engine. 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 Section 250 of this manual.

*NOTE: Do not hold the starter button in "crank" position for more than 30 seconds at a time. To do so may overheat the starter.*

6. As the engine begins to run, check to see that the oil pressure light goes out. If not, stop the engine and determine the cause. See Section 150 of this manual.

Check ammeter for alternator charging rate. If no charge is shown, refer to Section 150 of this manual.

### AFTER-STARTING INSPECTION

1. Make sure that oil pressure light goes out.
2. Be sure ammeter shows charge.
3. Check for water, oil, or hydraulic leaks.
4. Check the transmission hydraulic system oil level.



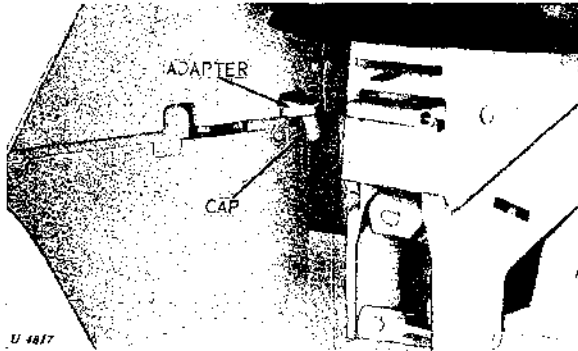
**COLD WEATHER STARTING****COLD WEATHER STARTING FLUID ADAPTER**

Fig. 10-10-2—Starting Fluid Adapter

The tractor is equipped with an adapter (Fig. 10-10-2) to inject atomized starting fluid into the engine air intake system. The starting fluid, which aids fuel combustion, is furnished in pressurized cans.

To use the can of starting fluid, remove the safety cap and plastic spray button from the can. Remove the cap from the adapter and position the can under the adapter. To inject starting fluid, push up on the can.

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

Relax pressure on the can between "shots" of starting fluid. Stop injecting fluid after the engine starts. If the engine begins to die during the first few minutes of operation, inject another "shot" of fluid. When the engine is operating satisfactorily, remove the can from the adapter and replace the safety cap on the can.

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

Store starting fluid cans where they will not be subject to extreme cold or warm temperatures. For best results, store fluid at room temperature.

**CAUTION:** Ether starting fluid is highly flammable.

**ADDITIONAL BATTERIES**

Starting the engine in cold weather can be facilitated by connecting an additional 24 volts of booster batteries in parallel with the tractor batteries.

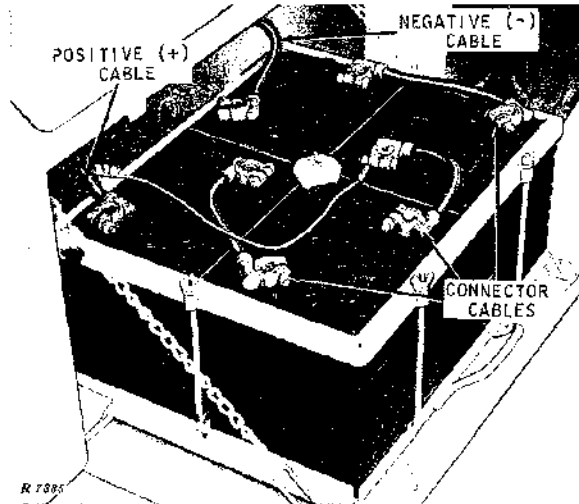


Fig. 10-10-3—Battery Connections

Use jumper cables to connect the positive (+) terminal of the booster battery assembly to the positive terminal of the tractor battery assembly (Fig. 10-10-3). To make the last connection or the first disconnection at some point away from the battery, connect the negative (-) terminal of the booster battery to a good ground on the tractor frame away from the battery. Never connect jumper cable to pipes or thin sheet metal.

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

**CRANKCASE OIL HEATER**

The tractor is designed to permit use of a 240-watt electrical crankcase oil heater. The heater warms the oil in the crankcase to facilitate engine starting.

To install the crankcase oil heater, drain crankcase oil and remove plug (Fig. 10-10-4) from right front side of case. Apply thread paste to threads of heater, install heater and refill crankcase. When heater is to be put to use, re-

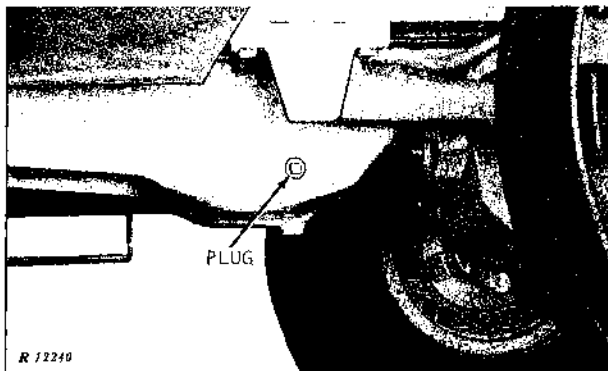


Fig. 10-10-4—Plug for Crankcase Oil Heater Installation

move protective cap, attach cord, and plug into any convenient 115-volt electrical source with suitable ground.

The connector at the heater has a release lever to lock the connector to the heater. Press the lever when connecting or disconnecting the cord.

#### HYDRAULIC PUMP



Fig. 10-10-5—Hydraulic Pump Shut-Off Screw

If the tractor has a hydraulic pump shut off screw located on top of the hydraulic pump, the starter speed may be increased during cold weather by shutting off the hydraulic pump so that it will not build up pressure. To do so, turn the shut off screw in "clockwise" one turn with a screwdriver. Then turn the screw in by hand until resistance is felt. Turn the screw in one more turn.

After the engine has started, use a screwdriver to back off the shut-off screw out against the internal stop (turn the screw 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.*

The hydraulic pump shut-off screw is available from John Deere parts depots for field installation.

#### POWERSHAFT CLUTCH DRIVE

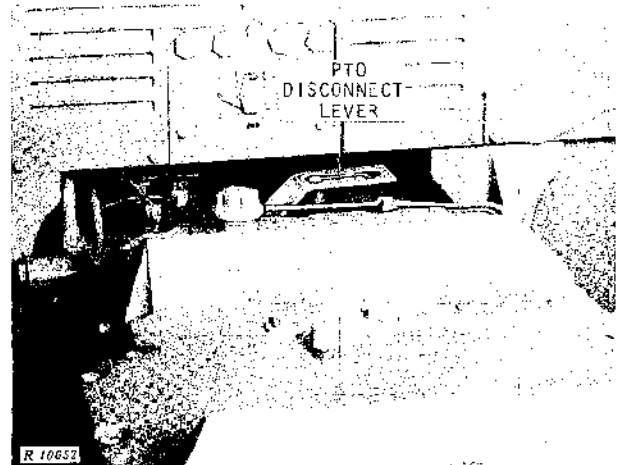


Fig. 10-10-6—PTO Drive Disconnect Lever

An additional method of removing drag from the engine to assist in cold weather starting is to disconnect the power take-off clutch drive. The drive is disconnected when the straight edge of the disconnect lever (Fig. 10-10-6) is up. Drive is disconnected by lifting up lever and rotating it 180 degrees, then returning it to the slot.

*NOTE: Always disconnect the power take-off drive when the PTO is not being used.*

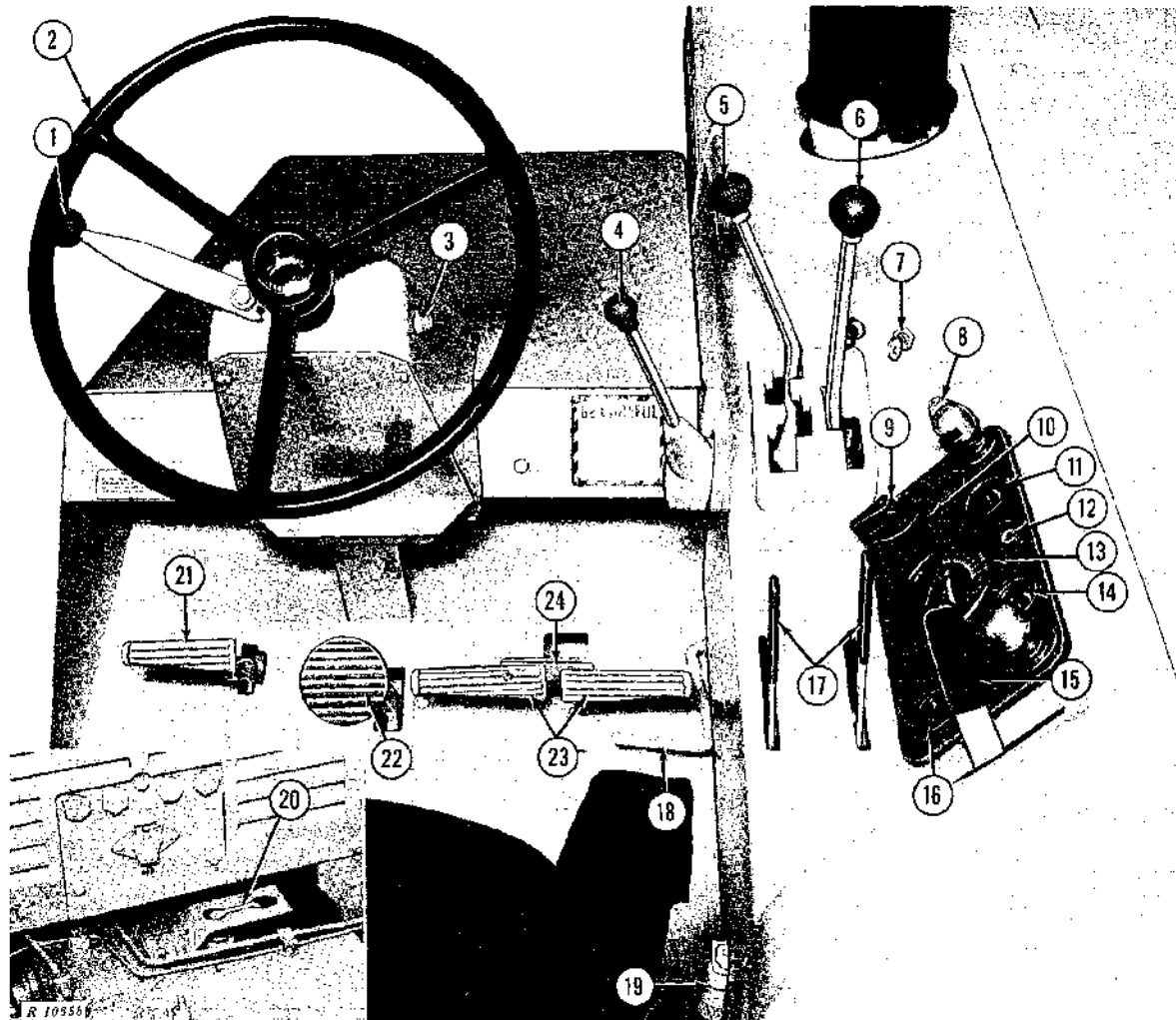
If the tractor will be used for PTO work, engage the PTO by rotating the lever 180 degrees with the engine stopped. If the drive does not engage easily, momentarily engage the engine starter while maintaining pressure on the lever.

#### STOPPING THE ENGINE

After operating the engine under load, run the engine at slow idle (800 rpm) for at least one or two minutes before stopping. This will allow the engine to cool gradually, preventing uneven contraction of parts and coking of lubricating oil on piston rings, valve guide, etc.

Turn the key switch off. After a few revolutions the engine will stop.

## OPERATING CONTROLS



- |                                   |  |
|-----------------------------------|--|
| 1 - Scraper Brake Operating Lever | 13 - Speed Meter                         |
| 2 - Steering Wheel                | 14 - Ammeter                             |
| 3 - Horn Button                   | 15 - PTO Clutch Operating Lever          |
| 4 - Hand Throttle Lever           | 16 - Fuel Gauge                          |
| 5 - Range Selector Lever          | 17 - Selective Control Operating Levers  |
| 6 - Hi-Lo Shift Lever             | 18 - Foot Throttle                       |
| 7 - Key Switch                    | 19 - Cold Weather Starting Fluid Adapter |
| 8 - Starter Button                | 20 - PTO Drive Disconnect Lever          |
| 9 - Light Switch                  | 21 - Clutch Operating Pedal              |
| 10 - Speed Meter Knob             | 22 - Differential Lock Operating Pedal   |
| 11 - Water Temperature Gauge      | 23 - Brake Operating Pedals              |
| 12 - Oil Pressure Indicator Lamp  | 24 - Brake Pedal Bar                     |

Fig. 10-10-7—Operating Controls

## OPERATING THE TRACTOR

Operating controls are illustrated in Figure 10-10-7.

### ENGINE WARM-UP

The engine should be at operating temperature before operating it at full load. A practical warm-up is to idle the engine at about 1500 rpm for a few minutes, then operate at a light load (at the next lower speed than normally used for the load) until the engine is at operating temperature.

### ENGINE BREAK-IN

With the following exceptions, the diesel engine is ready for normal operation.

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

After the first 100 hours of service, change both the engine oil and oil filter. Thereafter, change the filter at the normal 200 hour interval. If, during the first 100 hours, it is necessary to add engine oil, use the proper single viscosity, specification Mil-L-2104B oil. See page 30-5-1.

*NOTE: Observe engine coolant carefully during break-in period. If temperature rises above normal operating range, shift to a lower gear to reduce load on the engine.*

### ENGINE SPEEDS

The engine is designed to operate at working speeds ranging from 1500 to 2200 rpm. These are variable governed speeds, and the engine can be operated at any speed between the two extremes to meet various working conditions.

Slow idle speed of the engine is 800 rpm.

### Foot Throttle

Since engine speed most used is 2200 rpm and since engine speed must be varied quickly when shifting the transmission, the foot throttle (Fig. 10-10-8) is usually used to control engine speed.

The foot throttle is used to raise engine speed above the speed selected by the hand throttle. When the foot throttle is pushed all the way downward, the engine operates at the 2200 rpm load speed.

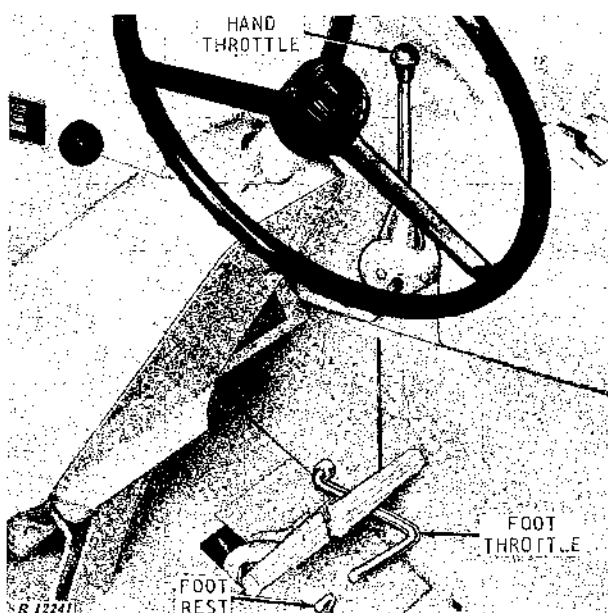


Fig. 10-10-8—Foot Throttle and Hand Throttle

### Hand Throttle

The hand throttle (Fig. 10-10-8) is normally used to control engine speeds when the tractor is operated without the scraper.

The hand throttle may be used to select slow idle or any of the engine working speeds from 1500 to 2200 rpm. When the throttle is moved all the way forward, the engine operates at the 2200 rpm load speed.

To obtain the slow idle speed of approximately 800 rpm, move the throttle to the rear as far as it will go.

## SELECTING GROUND SPEEDS

The transmission has four speed ranges, grouped in four shift stations (Fig. 10-10-10). Three of the ranges have low, high and reverse gears. The fourth range has low and high speeds only. Thus, eight forward speeds and three reverse speeds are provided, which, 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 speed at a high engine speed or in a higher speed at a lower engine speed.

*NOTE: Avoid overloading tractor. Overloading causes undue strain on parts, eventually resulting in poor operation and unnecessary repair expense.*

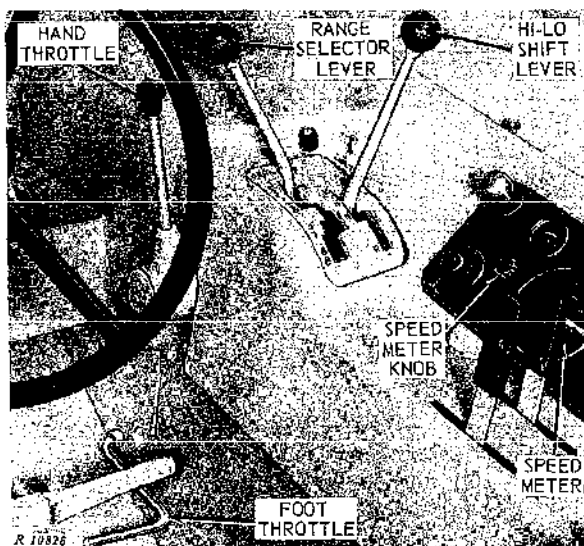


Fig. 10-10-9—Shift Levers and Quadrant

Shifting is accomplished by means of two levers located to the left and forward of the instrument panel (Fig. 10-10-9). The range selector lever is used to shift between stations. By moving the lever from one station to another, a new range of speeds is available. This shift is made when the tractor is stopped or by using the proper "double-clutching" technique when the tractor is moving. This technique is explained on page 10-10-7. The desired speed within a range is selected by means of the Hi-Lo shift

lever, located at the right of the range selector lever. The Hi-Lo shift lever has four positions: "L" (Low), "N" (Neutral), "H" (High), and "R" (Reverse). When the Hi-Lo shift lever is in the "L" position the transmission is in the lower speed of the range. When the lever is in the "H" position, the transmission is in the higher speed of the range. When the lever is in the "R" position, the transmission is in reverse.

## Gear Shifting

Figure 10-10-10 illustrates details of the gearshift quadrant.

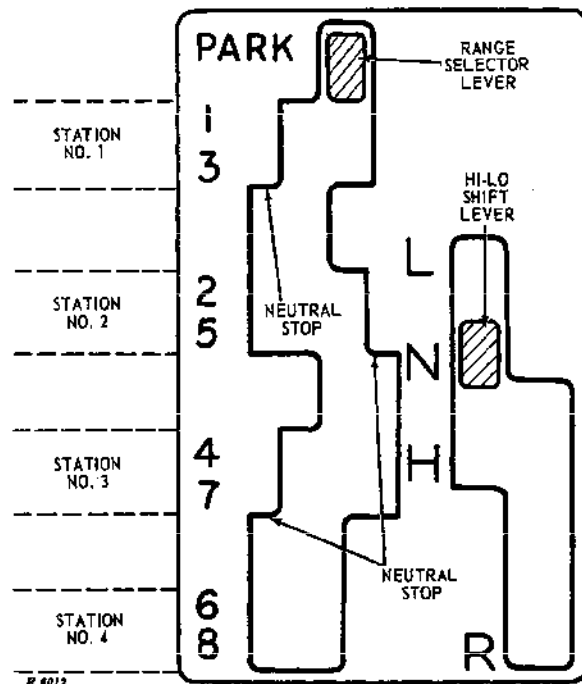


Fig. 10-10-10—Details of Shift Quadrant

Depress the clutch pedal and move the range selector lever into the desired station (Fig. 10-10-10). Move the Hi-Lo shift lever from neutral to "H," "L," or "R" to obtain the desired speed within the range. Gradually release the clutch to take up the load smoothly. With the clutch pedal depressed, the Hi-Lo shift lever can be shifted from the low to the high or the high to the low range of speeds in any station while the tractor is moving. The lever can also be shifted from forward to reverse (except in Station No. 4) without stopping the tractor. To avoid injury or damage, reverse direction only at very slow speeds.

**Double Clutch Shifting**

Normally, shifting between stations is made while the tractor is in motion by double clutching when shifting. Basically this is a matter of engaging the clutch momentarily while the range selector lever is in neutral, and bringing the engine speed up or down to match the speed of the next desired station.

For example: Suppose the transmission is in 5th speed while the engine is operating at 2200 rpm. For higher ground speed it is desired to shift into 7th speed. Leave the Hi-Lo shift lever in "H," depress the clutch pedal, release the foot throttle, and move the range selector lever to neutral. (This lever is in neutral when it is located in any space in the quadrant between stations.)

Momentarily engage the clutch until engine speed has decreased to about 1200-1400 rpm. Disengage the clutch, move the range selector lever to 7th speed, and engage the clutch. This shift requires a little time (2 to 5 seconds) and cannot be rushed or clash will result. Note that engine speed is reduced about 50 percent.

Down shifting must be done rapidly. To down shift from 7th to 5th speed, for example, reduce engine speed to 1300-1500 rpm, disengage the clutch (but do not let up on the foot throttle), and move the range selector lever against the upper neutral stop illustrated in Figure 10-10-10. (The three neutral stops are provided for down shifting.) Rapidly engage and disengage the clutch, move the selector lever to 5th speed, and engage the clutch. The entire shift requires only 1 to 2 seconds.

**CAUTION:** Do not overspeed the engine when the clutch is engaged after down shifting. To prevent overspeeding of the engine, avoid down shifting when the engine speed is 1500 rpm or higher.

The above procedures with minor variations to meet operating conditions, will result in "no

clash" shifts between range stations but require practice. Avoid forcing the shift lever when a mismatch occurs due to improper timing during the shifting process. Unnecessary clash may cause damage. In general, double clutching is necessary for any shift of the range selector lever while the tractor is in motion.

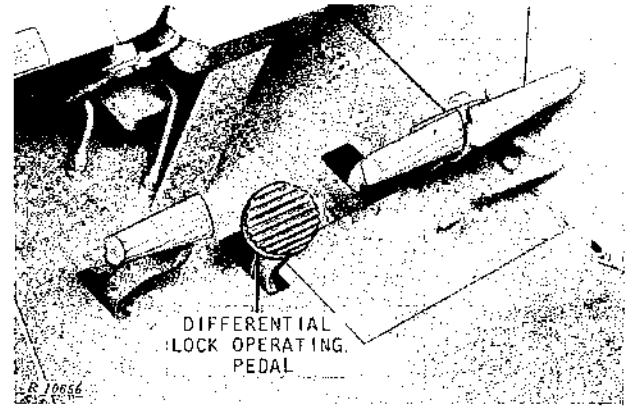
**DIFFERENTIAL LOCK**

Fig. 10-10-11—Differential Lock Operating Pedal

When conditions are encountered where one drive wheel has lost traction, tractor movement can often be maintained by using the differential lock.

To engage the differential lock, depress the operating pedal (Fig. 10-10-11) and hold it until conditions improve. Releasing the pedal pressure disengages the lock. The front wheels should be in the straight ahead position when the differential lock is engaged or disengaged.

*NOTE: So long as the differential lock is applied any attempt to turn the tractor will be resisted by the action of the locked differential. Under some conditions it may be necessary to engage the lock intermittently to maintain tractor motion in the direction desired.*

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

### PARKING THE TRACTOR

When the tractor is stopped for parking, move the Hi-Lo shift lever to the "N" (neutral) position and move the range selector lever as far as it will go forward into the "PARK" position. The lever, once in "PARK," must be moved from this position before the Hi-Lo shift lever can be moved from neutral.

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

### TOWING THE TRACTOR

Place the range selector lever in any neutral position and the Hi-Lo shift lever in the "N" (neutral) position when towing the tractor. This will eliminate unnecessary wear of the transmission parts. Be sure the transmission oil level is at the full mark. If the front end is raised for towing, add 1 gallon of oil for each six inches the front end is raised. When possible, run the engine to maintain hydraulic pressure for power operation of steering and brakes.

**CAUTION:** Never tow the tractor at high speed. Always attach tow bars or chains to the tow hooks provided.

### HYDRAULIC SYSTEM

The hydraulic system is a constant pressure, closed center, variable displacement type that supplies oil under pressure to operate power steering, power brakes, power take-off clutch, differential lock, transmission clutch, remote hydraulic cylinders (if so equipped) or, the equipment brakes and cylinders.

Pressure and flow of the oil are maintained by a variable displacement, constant pressure pump driven by the engine crankshaft. The reservoir for the system is the transmission case, and oil is carried through external pipes and hoses to each hydraulic function. All oil in the system is filtered through full-flow filters.

### POWER BRAKES

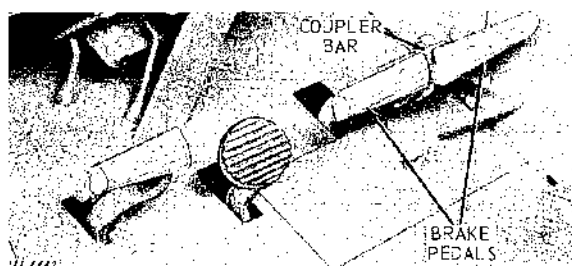


Fig. 10-10-12—Brake Pedals and Coupler Bar

The tractor is equipped with hydraulically actuated power brakes. Each brake pedal (Fig. 10-10-12) can be applied individually to assist in making short turns or simultaneously for slowing or stopping the tractor. When traveling at high speeds or whenever individual brakes are not needed couple the brake pedals together.

### Scraper Brake Lever

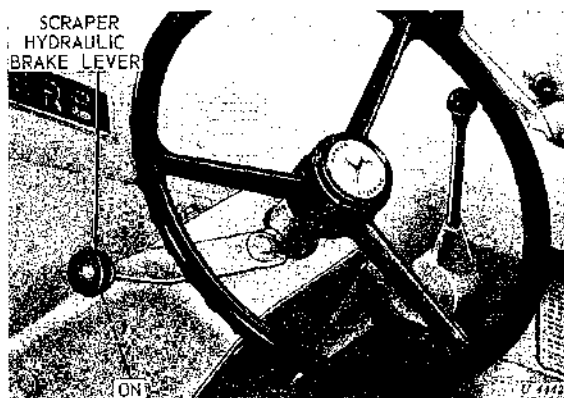


Fig. 10-10-13—Scraper Brake Lever

On scraper units, power scraper brakes are operated by the scraper brake lever (Fig. 10-10-13) under the steering wheel. Pulling down on the lever applies the scraper brakes.

**CAUTION:** Normally use the scraper brake to slow or stop the scraper unit. For more brakes, gradually apply BOTH tractor brakes AFTER fully applying the scraper brakes. NEVER USE TRACTOR BRAKES ALONE. To do so may cause the scraper unit to jackknife or upset.

**Brake Selector Lever**

On tractors equipped with a brake selector lever (Fig. 10-10-14), the lever is used to control the brakes of an Athey Rock Wagon or other trailing equipment.

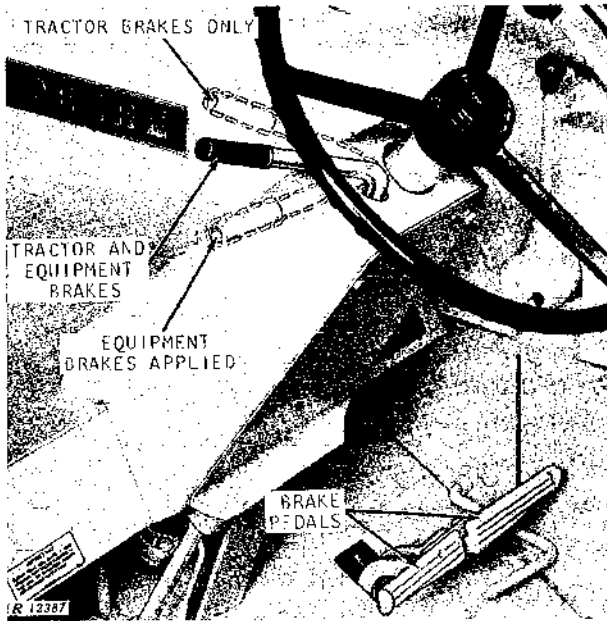


Fig. 10-10-14—Brake Selector Lever

When the brake selector lever is in the center position, both the tractor brakes and the equipment brakes are applied whenever both brake pedals are depressed. When one brake pedal is depressed for individual brake application, only the one tractor brake will be applied.

When the brake selector lever is held in the forward position, only the tractor brakes will be applied when the brake pedals are depressed.

When the brake selector lever is pulled rearward, the brake selector lever applies only the equipment brakes.

**CAUTION:** Under poor traction conditions, avoid jackknifing by applying the equipment brakes first with the brake selector lever. For more brakes, gradually depress both brake pedals to apply the tractor brakes. Never use tractor brakes alone to slow or stop the tractor and rock wagon or other trailing equipment. When traveling at transport speeds, always couple the brake pedals together to prevent accidental application of only one tractor brake.

**Accumulator**

An accumulator provides energy for several brake applications after the engine is stopped or should the hydraulic pressure fail.

**EQUIPMENT CONTROL SYSTEM**

**Power Take-Off**

The power take-off shaft is used to operate powershaft-driven equipment such as the elevator on the scraper. Moving the operating lever (Fig. 10-10-15 or 10-10-16) away from the operator engages the clutch; moving the lever toward the operator disengages the clutch and applies the PTO brake (brake is designed to stop only the PTO shaft).

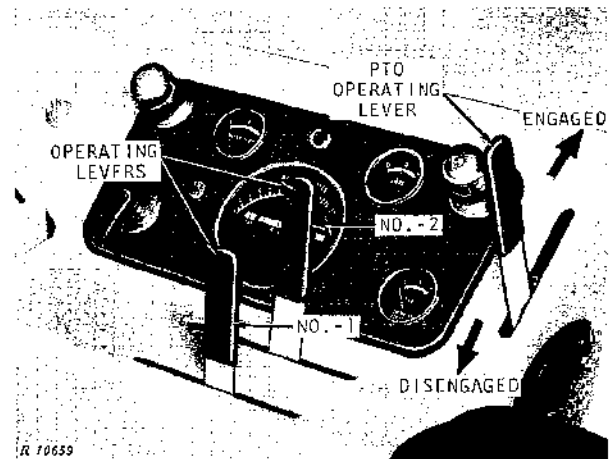


Fig. 10-10-15—PTO and Selective Control Operating Levers (Selective Control Valves Lengthwise on Tractor)

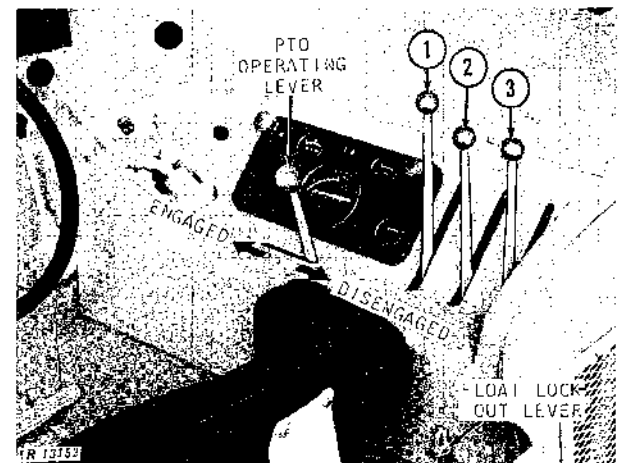


Fig. 10-10-16—PTO and Selective Control Operating Levers (Selective Control Valves Crosswise on Tractor)



*Dual or Triple Selective Control*

On scraper units with dual or triple selective control valves (Figs. 10-10-15 and 10-10-16), No. 1 valve operating lever has the following positions: away from the operator to lower the scraper bowl, spring-centered neutral, and toward the operator into a detented raise position. The lever will remain in the detented raise position until it is moved toward neutral.

No. 2 valve operating lever has the following positions: away from the operator into a detented dump position, spring-centered neutral, and toward the operator into a detented position to close the bowl bottom. The lever will remain in the detented position until it is moved toward neutral.

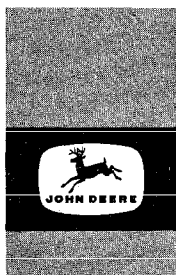
No. 3 valve operating lever has the following

positions: toward the operator into a detented equipment raise position, spring-centered neutral, part way away from the operator for power lowering, and all the way away from the operator into a detented float position. The lever will remain in the detented positions until it is moved toward neutral.

When the float lock out lever is up (Fig. 10-10-16) the No. 3 operating lever cannot be moved into the float position. When the float position is desired, push the lever in and turn it down.

*Single Selective Control*

On tractors with a single selective control valve, the valve operating lever has the same operating positions as the No. 3 operating lever in Figure 10-10-16. The single selective control lever does not have a float lock out mechanism.



## Section 20

# SPECIFICATIONS

### Group 5

## TRACTOR SPECIFICATIONS

(Specifications and design are subject to change without notice)

#### HORSEPOWER (at 2200 rpm):

Net engine flywheel (at 500 ft. altitude and 85° F. temperature).  
Engine equipped with fan, air cleaner, water pump, lubricating oil pump, fuel pump, and alternator.. 143 hp

#### ENGINE

Type . . . Vertical, 6 cylinder, in-line, valve in head, 4-stroke cycle, full diesel

#### Engine speeds

Slow idle . . . . . 800 rpm  
Working speeds . . . . . 1500 to 2200 rpm  
Bore and stroke . . . . . 4-3/4 x 5 in.  
Displacement . . . . . 531 cu. in.  
Compression ratio . . . . . 16.1 to 1  
Firing order . . . . . 1-5-3-6-2-4  
Valve clearance Intake . . . . . 0.018 in.  
Exhaust . . . . . 0.028 in.

#### CAPACITIES

Fuel tank . . . . . 73 U.S. gal.  
Crankcase . . . . . 20 U.S. qts.  
Transmission-hydraulic system . . . . . 16 U.S. gal.  
Cooling system . . . . . 9 U.S. gal.

#### LUBRICATION SYSTEM

Type . . . Force feed, pressurized with full-flow oil filter

#### FUEL SYSTEM

Type . . . . . Direct, solid injection  
Injection pump . . . Inlet metering, distributing-type  
Injection pump timing . . . . . TDC  
Air cleaner . . . . . Dry element type

#### COOLING SYSTEM

Type . . . . Pressurized, centrifugal pump  
Temp. control . Two heavy duty thermostats

#### GROUND SPEEDS

*NOTE: The ground speeds shown below are obtained with 18.00-25 or 23.5-25 Earthmover tires having a loaded radius of 28.7 inches.*

Gear	1500 Rpm	1900 Rpm	2200 Rpm
1st	1.7 mph	2.2 mph	2.5 mph
2nd	2.8 mph	3.5 mph	4.1 mph
3rd	3.7 mph	4.6 mph	5.4 mph
4th	4.7 mph	6.0 mph	6.9 mph
5th	5.9 mph	7.4 mph	8.6 mph
6th	7.7 mph	9.7 mph	11.3 mph
7th	10.0 mph	12.6 mph	14.6 mph
8th	16.2 mph	20.6 mph	23.8 mph
3rd reverse	3.6 mph	4.5 mph	5.2 mph
5th reverse	5.7 mph	7.2 mph	8.4 mph
7th reverse	9.7 mph	12.3 mph	14.2 mph

8th at 2400 rpm  
(fast idle no-load engine speed) 26.1 mph

#### TRANSMISSION CLUTCH

Type . . . Heavy-duty, two 12-in. dry plates, foot operated, hydraulic assisted.

#### TRANSMISSION

Type . . . . . Syncro-Range, constant mesh  
Speed selections . . 8 forward, 3 reverse in 4 stations

#### Shifting

Within stations . . . . . Synchronized  
Between stations . . . . . Collar shift

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