

AR-AO TRACTORS (SERIAL NO. 250000-271999)



JOHN DEERE

OPERATORS MANUAL AR-AO TRACTORS (SERIAL NO. 250000-271999)

OMR2003 K3 English

OMR2003 K3

LITHO IN THE U.S.A.
ENGLISH

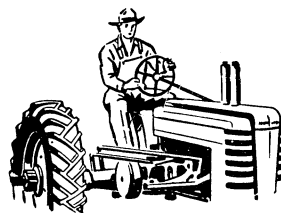


Y
C
D



K 3
3
0
0
2
R
M
O

CONGRATULATIONS...



WE welcome you to our ever-growing family of John Deere tractor owners. We are confident that the dependable and economical performance of your new tractor will prove that you made a wise choice.

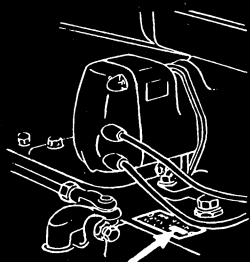
Back of your tractor is an organization that has been building farm equipment for more than one hundred years. The plant in which your tractor was built is the largest single tractor plant in the world. In this modern factory, equipped with the finest precision machinery, fine materials, high-grade workmanship, thorough inspection, and complete testing are combined to give you the best in dependable tractor performance and economical tractor operation.

The way you operate your tractor and the care you give it have much to do with the service and satisfaction you will get from it. This manual has been carefully prepared and profusely illustrated to show you what to do and when to do it. It has been written by the best engineers in the John Deere tractor factory. Make it your guide. Study it carefully. Refer to it often. Only by following the suggestions it contains can you hope to get the most from your investment.

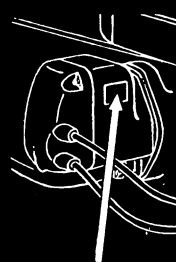
If you find that you need information not covered in this manual, or if your tractor requires special servicing, which it will periodically, take advantage of the facilities offered by your John Deere dealer. He has trained mechanics, who are kept informed on the best methods of John Deere tractor servicing and can give you prompt, "know-how" service in the field or in his shop.

When in need of parts, go to your John Deere dealer. Be sure to give him the serial number of your tractor. The illustrations, below, will show you where to find the serial numbers of your tractor and magneto. Obtain these serial numbers from your tractor—NOW—and insert them in the spaces provided in the illustrations below.

TRACTOR



MAGNETO



• TABLE OF CONTENTS •

SPECIFICATIONS AND DATA	4-5
CONTROLS.....	7-13
Contains information regarding Seat, Steering, Shutter and Fuel Control with Heat and Oil Gauges, Choke Lever, Engine Cranking, Brakes, Clutch, Gear Shift Lever and Power Shaft.	
STARTING THE NEW TRACTOR.....	13-19
Contains information regarding Fuels, Fuel Storage, Run-In Period for the New Tractor, Before Starting the Engine, Starting the Engine, Operating the Trac- tor, Stopping the Tractor, and Stopping the Engine.	
LUBRICATION.....	20-28
Contains information regarding Purpose of Lubrica- tion, Storage of Lubricants, Engine Lubrication, Transmission Lubrication, and Periodic Lubrication Service.	
SERVICE THAT WILL KEEP YOUR TRACTOR IN TIP- TOP SHAPE	29-49
Contains information regarding Fuel System, Ignition System, Cooling System, Clutch, Tappet Adjustment, Brakes, Pulley Brake, Front Wheels, Tire Inflation, Rubber Tire Inflation Chart, Care of Rubber Tires, Weighting Rear Wheels, Drawbar, Starting and Light- ing Equipment, Storing the Tractor, and Service Suggestions.	
SERVICE REMINDERS.....	50
STORING THE TRACTOR.....	51
SAFETY SUGGESTIONS.....	52-53
TRACTOR DIFFICULTIES.....	54-57
JOHN DEERE DEALER PARTS AND SERVICE.....	58
INDEX.....	60-61

Even though your dealer has carefully inspected this tractor before delivering it to you, it is always good business to re-check the items which are encircled on the reproduction below of the envelope which contains this manual.

TO THE NEW JOHN DEERE TRACTOR OWNER

Each John Deere tractor is carefully designed, assembled, and given a complete test and final inspection at the factory before it is shipped. Our main ambition is to deliver tractors to new owners in the same mechanical condition as when shipped from the factory.

To enable us to fulfill this one ambition, this tractor was carefully inspected for irregularities that may have occurred in shipment. This inspection included a complete checking of the following:

- ☒ Wheel equipment; Tire pressure; Wheel weights; Install calcium chloride if requested by new owner.
- ☒ Radiator; Fill with water or anti-freeze; Inspect shutter control.
- ☒ Air cleaner; oil level.
- ☒ Crankcase; oil level.
- ☒ Transmission oil level.
- ☒ Oil crankcase breather core.
- ☒ Grease tractor.
- ☒ Brakes
- ☒ Rear wheel brakes.
- ☒ Clutch operation.
- ☒ Spark plug gaps.
- ☒ Engine speed and oil pressure
- ☒ Carburetor setting (may require adjusting later according to fuel burned). (See Instructions in Manual.)

If Equipped with Starter or Light Equipment

- ☒ Install new battery; check water level; Grease terminal posts.
- ☒ Check charging rate.
- ☒ Check starting motor for operation.
- ☒ Serial numbers entered in owner's register.

The above inspection made by John Doe
Date 11/16/44 Dealer Good Business Corp.



**HANG THIS BOOK IN A
HANDY PLACE**

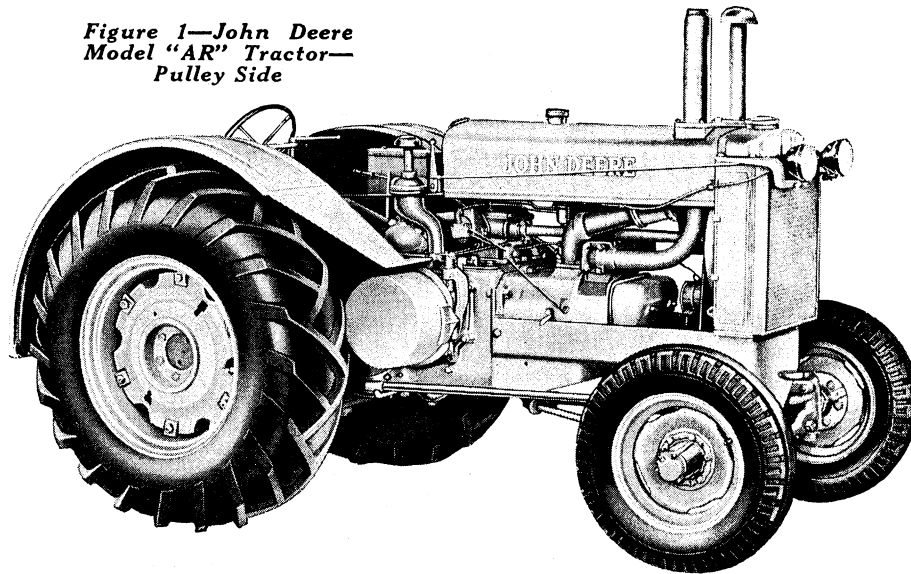
We suggest this rechecking especially during freezing weather or when a period of time has elapsed between delivery and when you are ready to operate it. For complete starting information, see page 15.



We, your John Deere dealer, are mighty proud to add your name to our list of John Deere Tractor owners. Because we are interested in having you obtain from this new tractor all the comfort and long life that are built into it, we are pleased to discuss the following important maintenance operations:

- ☐ Controls.
- ☐ Breaking-in Period—Part Load, Open Throttle, Changing Oil.
- ☐ Method of Starting and Stopping Engine.
- ☐ Lubrication—Engine, Transmission, Grease Fittings, Air Cleaner and Oil Gauge.
- ☐ Cooling System—Adding Water, Shutter Control, Cleaning.
- ☐ Fuel System—Fuel, Fuel Control, Sediment Bowl and Trap, Carburetor Adjustment.
- ☐ Crankcase Breather and Ventilator.
- ☐ Tires—Inflation, Inspection, Wheel Weights.
- ☐ Drawbar—Adjustment; pull from no other place.
- ☐ Magneto Care—Terminals Tight, Cleaning, Oiling, Adjusting Points.
- ☐ Brakes—Adjustment.
- ☐ Clutch—Adjustment, Pulley Brake.
- ☐ Front Wheels—Cleaning and Adjusting.
- ☐ Starter and Lights—Starting, Charging Rate, Changing Fuse, Battery Care.
- ☐ Tightening Bolts and Nuts—Caution on Governor Cover Cap Screws.
- ☐ Safety in Operation—Selecting Proper Speed, Power Shaft.
- ☐ Keeping the Tractor Clean.
- ☐ Have Farmer Operate the Tractor.
- ☐ Appointment for After-Sales Service—not later than two weeks after delivery.

*Figure 1—John Deere
Model "AR" Tractor—
Pulley Side*



S P E C I F I C A T I O N S

CAPACITY:

2-16" plow bottoms under normal soil conditions, or 3-14" plow bottoms under favorable conditions.

Maximum Belt Horsepower . . . 30.33

Maximum Drawbar Horsepower . 26.52

Maximum Pull 4248 lbs. at 1.75 M.P.H.
(Nebraska Test No. 378.)

SPEEDS:

Forward: 2, 3, 4 and 6-1/2 M.P.H. on 13-26 pneumatic tires.

Reverse 3-1/4 M.P.H.

ENGINE:

Engine . . . Two-cylinder, cast in block—valves in head.

Engine Speed 975 (Load)

Bore and Stroke 5-1/2" x 6-3/4"

Displacement 321 cubic inches

Compression Ratio 4.45 to 1

Carburetor Natural-draft type.

Magneto High-tension with automatic impulse.

Spark Plugs 18mm. Champion No. 8 Com. C. Spark plug gap .030".

Lubrication . . . Full force-feed pressure system; with Purolator oil filter element. Total oil capacity 9 U. S. quarts.

Cooling System Thermo-siphon system with a water capacity of 8 U. S. gallons.

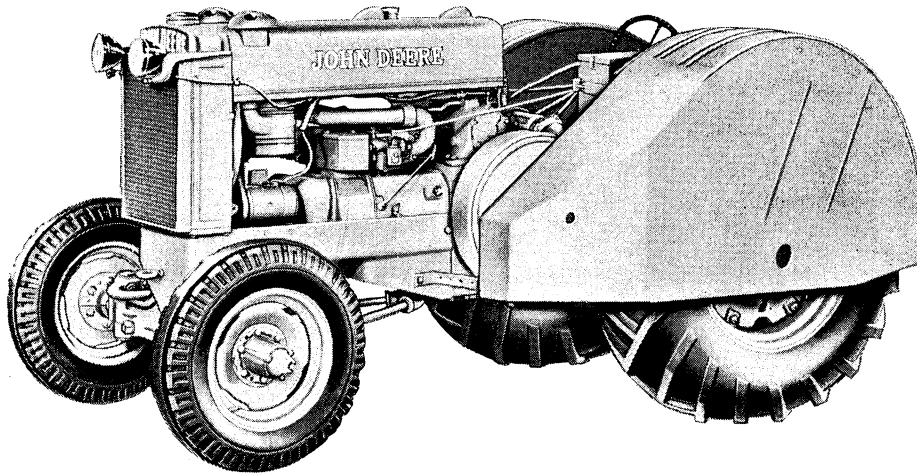
Air Cleaner . . . Oil-wash type.

Fuel System . . . Gravity-feed fuel system. Gasoline tank capacity—1 U. S. gallon. Fuel tank capacity—16 U. S. gallons.

Clutch . . . Hand operated, two 10" dry disks, locking in and out.

Belt Pulley Diameter 12-3/4"; width 7-1/4", 975 R.P.M.; Belt Speed 3270 F.P.M.

**Figure 2—John Deere
Model "AO" Tractor—
Flywheel Side**



A N D D A T A

TRANSMISSION:

Speeds . . . Four forward and one in reverse.

Gears . . . Selective type straight spur cut gears, forged, cut and heat treated.

Bearings . . . Shafts operate on 2 Hyatt roller, 4 Timken-tapered rollers and 6 New Departure ball bearings. Oil capacity 8 U. S. gallons.

REAR AXLES:

2-3/4" diameter. Mounted on 4 Timken-tapered roller bearings.

REAR WHEELS:

13-26, 6-ply tires, mounted on cast wheels, recommended for average field conditions. Steel spoke wheels with lugs available as special equipment. Diameter 42-3/4". Face 10".

BRAKES:

AR:

External contracting band type mounted on transmission shaft. Individual turning brakes furnished on special order.

AO:

Foot-operated, individual, automotive type, internal expanding brakes.

FRONT WHEELS:

6:00 x 16" 4-ply rubber tires. Mounted on 4 Timken-tapered roller bearings. Steel spoke wheels with guide bands available as special equipment. Diameter 28". Face 6".

DIMENSIONS:

On regular 13-26 pneumatic tires. Wheel base 76"; over-all height: AR—67", AO—57"; height to radiator cap 54-1/2"; over-all length 125-1/4"; width 64"; rear wheel tread 52"; turning radius: AR—13' 8", AO and AR with individual brakes 11' 5-1/2"; drawbar conforms with A.S.A.E. standards.

POWER TAKE-OFF:

Shaft diameter 1-3/8"; R.P.M. 544; splined end 16" above ground, 7/8" right center line of tractor and 14" ahead of hitch. Conforms with A.S.A.E. standards.

SHIPPING WEIGHT:

4093 lbs. on steel wheels. 4433 lbs. on 13-26 6-ply rear tires.

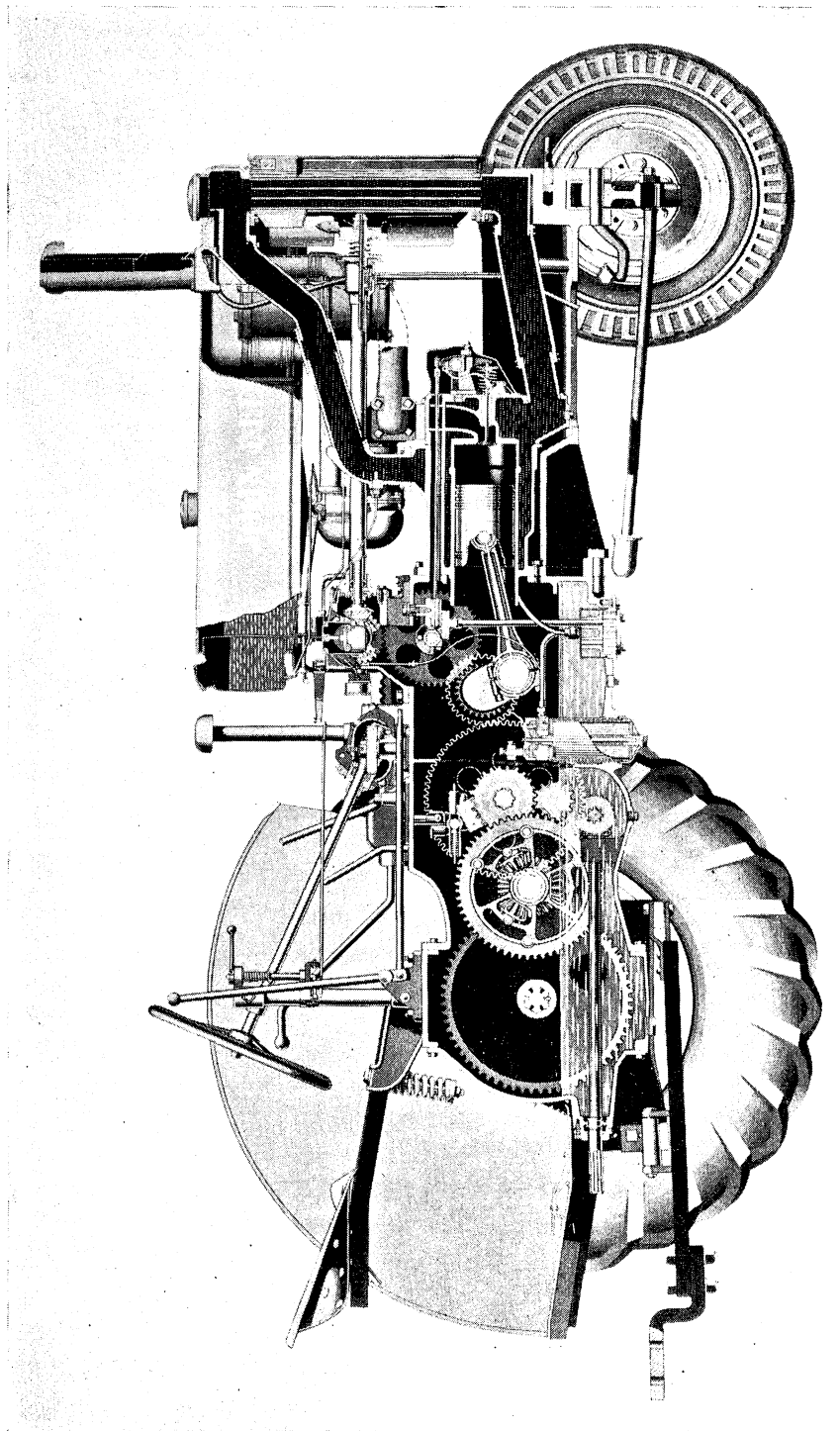


Figure 3—Cross-Sectional View of John Deere Model "AR" Tractor

CONTROLS

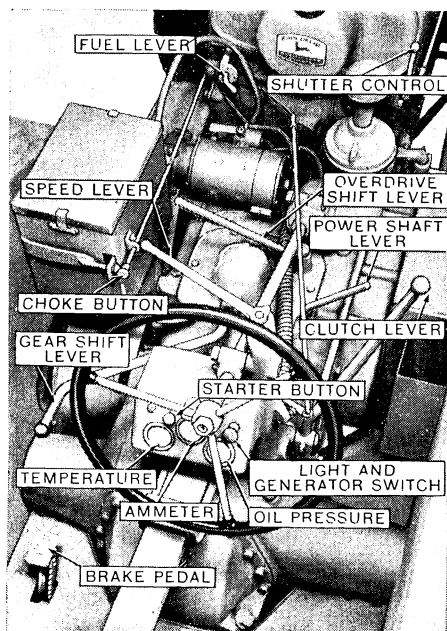


Figure 4—Controls of John Deere Model "AR" Tractor

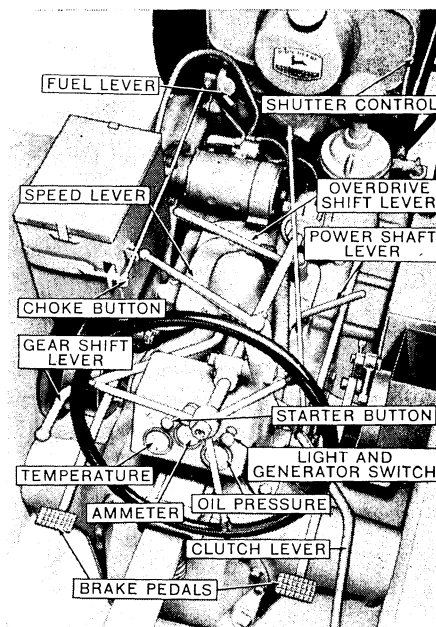


Figure 5—Controls of John Deere Model "AO" Tractor

The quality of work and the amount of work you do with your tractor not only depends upon the use of proper equipment, but also upon the ease and convenience of tractor operation. If you are in an uncomfortable position, if you have to fight the steering wheel, or if you can't see what you are doing, you are definitely handicapped.

Your John Deere tractor is as convenient to handle as your automobile. All controls are readily accessible. Clutch lever, throttle, fuel control and radiator shutter control are reached easily from the operator's seat. Under your foot is the convenient brake, and a large, comfortable platform on which you can stand if you so desire.

Familiarize yourself with all the controls provided for safe and easy operation of your new tractor. Regardless of your previous tractor experience, study this section covering controls carefully before you operate your tractor.

SEAT

The large, bucket-type seat is so located that you are generally out of the dust and have a clear, unobstructed view of your work.

The seat (and seat standard) ride on a coil spring that can be tightened or loosened to conform with the operator's weight for improved riding comfort. When working on rough ground or for heavy operators, more compression should be applied to the coil spring.

Whether you are tall or short, the seat can be adjusted backward or forward to a comfortable position by means of seat attaching bolt located directly under the seat.

Seat Adjusting Assembly (Special).

If you like to sit on a level seat, even though the tractor is tipped at an angle, such as in plowing, secure an AA3036R Seat Adjusting Assembly from your John Deere dealer. This assembly, when attached, also allows the seat to be rotated to face in any direction.

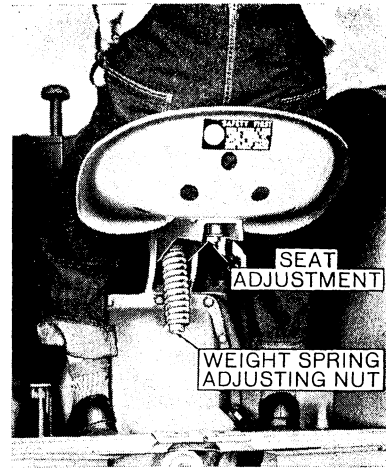


Figure 6—Seat

STEERING

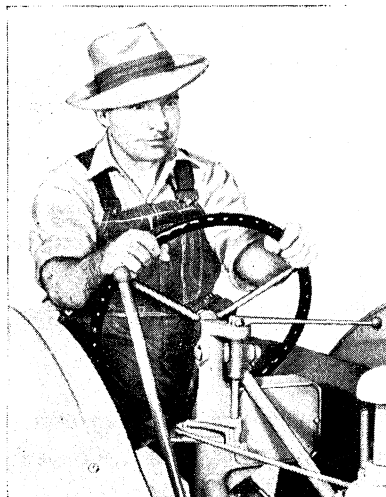


Figure 7—Steering Wheel

The seat location and general design permit you to easily see what you are doing at either side. This design, coupled with a steering mechanism built to eliminate entirely objectionable wobble, backlash, or whipping of the steering wheel, even in the roughest going, permits you to work in freedom and comfort.

Smooth, responsive steering can be maintained throughout the life of your tractor by means of the adjustments provided for this purpose.

Adjustments can be quickly and easily made by your John Deere dealer's serviceman.

SHUTTER AND FUEL CONTROL WITH HEAT AND OIL GAUGE

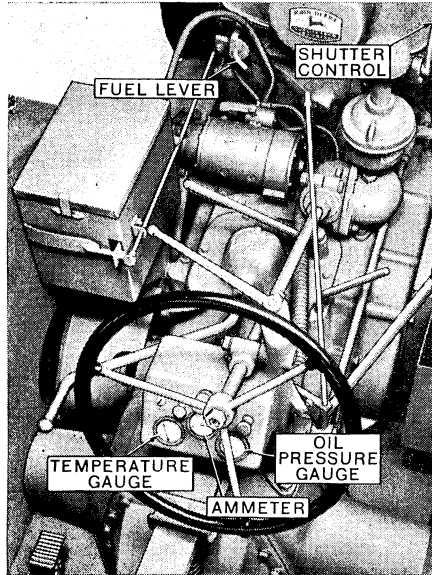


Figure 8—Gauges and Controls

off the fuel supply entirely without leaving his position at the wheel.

Located on the instrument panel is the oil pressure gauge. This gauge does not in any way tell the amount or condition of the oil in the crankcase.

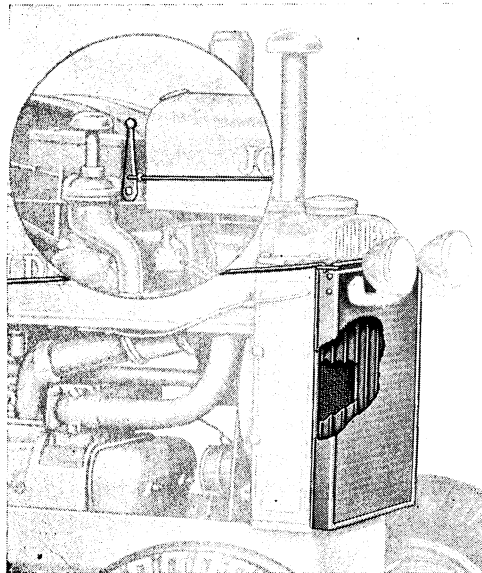


Figure 9—Radiator Shutter

The temperature of the tractor is effectively controlled from the driver's seat by means of a manually-operated radiator shutter.

The engine temperature gauge is located in plain sight of the operator and indicates when to adjust the shutter.

For best operation, the engine should always be operated up to its proper temperature, which is 190°F. registered on heat indicator. This results in greater all-around economy, better lubrication and more power.

A convenient, three-way fuel control lever, located within easy reach, enables the operator to switch from gasoline to low-cost fuel or to shut

off the fuel supply entirely without leaving his position at the wheel. It only indicates whether the oil pump is working. The indicator hand of the gauge should rest between the letters "M" and "H" when the engine is running fast idle. If pressure is not registered on the oil gauge when the engine is started, stop the engine immediately.

CHOKE

When starting the engine, set choke in full choke position. (On tractors equipped with electric starters, choking is accomplished by a button, mounted on the battery box.) On trac-

tors not equipped with electric starters, choke lever is on the carburetor.

Over-choking or excessive use of the choke will flood the engine, causing hard starting.

ENGINE CRANKING

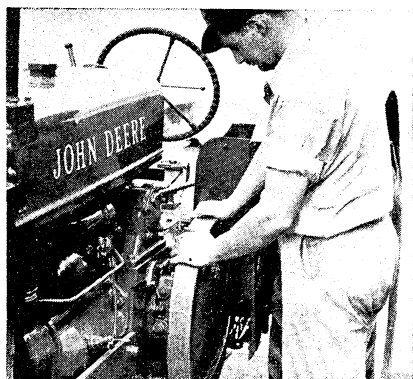


Figure 11—Hand Cranking

Hand Cranking: The flywheel method of starting is simple, safe, and easy. You simply grasp the flywheel and roll it forward slowly.

All controls are within easy reach.

Electric Starting: To start the tractor, pull choke, and starter button.

The starting motor is geared into the flywheel which is protected by a guard.

For additional information on starting, see section "Starting the New Tractor", page 15.

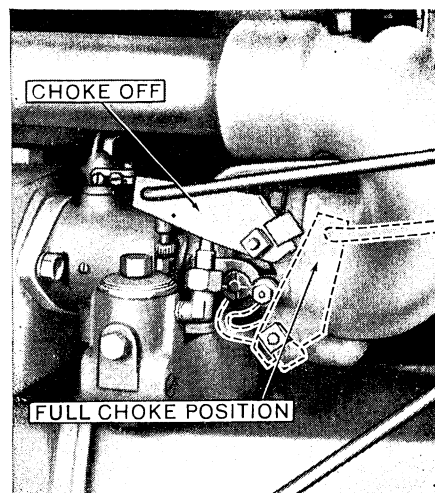


Figure 10—Choke

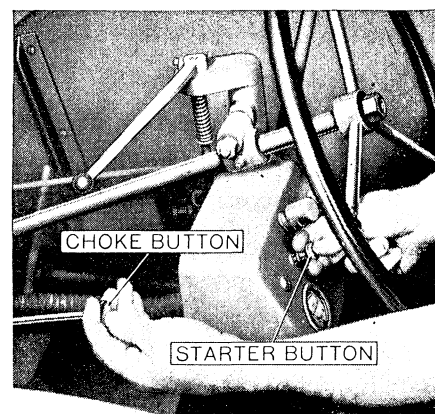


Figure 12—Electric Starting

BRAKES

The service brake is provided for safe control of the tractor while moving or to hold tractor stationary while on an incline or doing belt work.

Individually foot-operated brakes make possible short turns to right or left when desired.

If the brakes are pressed simultaneously with both feet, they assure you safer stopping at high transport speeds.

A brake latch is conveniently located for locking each brake when doing belt work or when stopping the tractor on a hill or incline.

Individual brakes may be had for your "AR" tractor on special order.



*Figure 13—Brake
Operation*

CLUTCH LEVER

The power required in putting the tractor in motion is gradually and smoothly applied to the drive system by slowly pushing the clutch lever forward. When the tractor picks up speed, give the lever a quick forward thrust until the clutch snaps into engagement.



Figure 14—Clutch Lever

By pulling back on the clutch lever, the clutch is released and the engine disconnected from the transmission. The pulley brake, which is a part of the clutch lever, stops the pulley from rotating, permitting easy shifting of the transmission gears.

When the engine is running and the tractor is not moving, the life of the clutch parts and pulley bearings can be prolonged by shifting the gear shift lever into neutral and engaging the clutch. This allows the pulley and crankshaft to turn as one unit, reducing frictional wear, and lengthening the life of clutch parts.

GEAR SHIFT LEVER

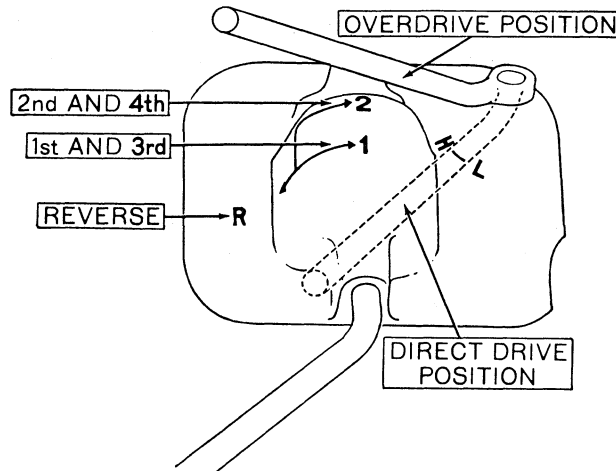


Figure 15—Gear Shift and Overdrive
Lever Positions

Familiarize yourself with the shifting diagrams before you attempt to operate the tractor.

If gears do not shift freely, move clutch lever forward until pulley turns slowly. This allows gear teeth to line up for shifting.

Avoid clashing of gears. This causes unnecessary wear and possible breakage.

POWER SHAFT

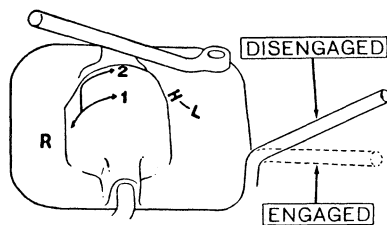


Figure 16—Power Shaft
Shift Lever

The power shaft is started and stopped with the clutch lever and can be operated whether the tractor is moving or not. To put the power shaft into operation, first move the power shaft shift lever to the engaged position, with gears in mesh. With the engine running, engage the clutch and the power shaft will operate.

Whenever the use of the power shaft is not required, disengage the power shaft shift lever.

Note: Make it a standing rule never to dismount from the tractor without first disengaging the power shaft lever.

STARTING THE NEW TRACTOR

FUELS

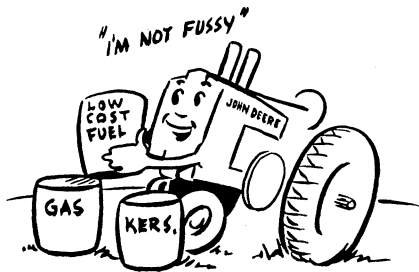
Now that you are familiar with the controls your next consideration before starting your tractor is the type of fuel you are going to use.

This John Deere tractor engine is designed to operate on gasoline, distillate, tractor fuel or kerosene, and no difficulty will be experienced with these fuels if the simple operating directions are followed.

Distillates and other low-octane, lower-cost fuels are manufactured to a variety of specifications; therefore, the tractor owner should investigate available fuels to determine which will give the most satisfactory results under the prevailing operating conditions, making sure that the directions

are followed for adjusting carburetor and maintaining temperature.

In all communities where these low-octane fuels are available, they are generally used in John Deere tractors because these tractors will burn them successfully without any detrimental effect to the working parts of the tractor and at a saving in fuel costs.



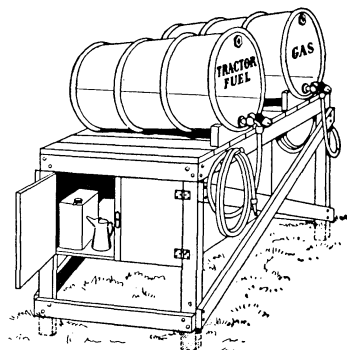
FUEL STORAGE

Fuel should be stored in a convenient place outside of buildings. If fuel drums are used, they should be located in a shady spot to prevent undue evaporation.

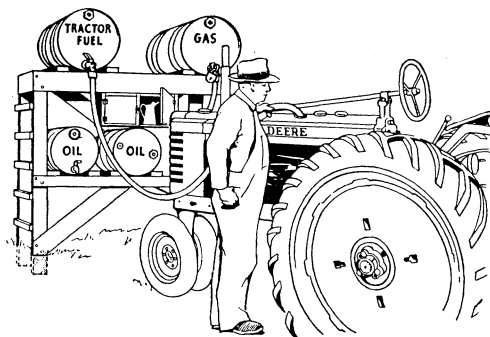
A rack for holding fuel and oil drums, as shown in Figure 17 and Figure 18, is simple to make and saves time and labor in refueling and lubricating the tractor, truck or family car.

These racks are built of two by fours, a few boards, and a handful of nails. Bolts are recommended instead of nails for the main framework.

Figure 17 shows a single-deck rack with a dust-proof cabinet in one end to store grease, oil funnel, measuring can, etc.



**Figure 17—Single-Deck
Fuel Storage Rack**



**Figure 18—Double-Deck
Fuel Storage Rack**

Figure 18 illustrates the double deck rack which contains the gas and fuel on top with the lower deck holding the oil, with a dust-proof cabinet for grease and containers.

The tractor fuel and gasoline drums should be tilted slightly towards the rear as shown in Figure 17 so that any metal that might flake from the inside of the drum or any other sediment will settle to the rear and will

not get out of the drum through the spigot. The hose nozzle should be capped when not in use so that no dust can get in. Be sure the drum vent plug is screwed in tight after using it. By cutting out the bottoms of two drums and welding them together, the capacity of each fuel storage tank will be doubled.

For stability, the uprights should be set several inches in the ground, as shown in illustration.

RUN-IN PERIOD FOR THE NEW TRACTOR

Before your new tractor was shipped from the factory, all bearings and friction surfaces were correctly and tightly fitted, and the crankcase contained a special "breaking-in" oil.

To be sure that all bearing surfaces will be properly lubricated, operate it on a part load for the first 20 hours of operation with the "breaking-in" oil in the crankcase, then drain out the "breaking-in" oil and refill with new oil in accordance with recommendations on page 21.

Keep engine temperature up to 190°F. because engine temperature is very important during the "breaking-in" period.

BEFORE STARTING THE ENGINE

SAFETY FIRST

Be sure gear shift lever is in neutral before starting engine.

Never refuel tractor while engine is running or extremely hot. Do not smoke or use an oil lantern when working around inflammable fuels, especially when refueling the tractor.

Before attempting to start or operate the tractor, familiarize yourself with the tractor and its various controls. Also check the following:

1. Check radiator water level, and, if necessary, add water up to bottom of baffle. (Use soft water or rain water if possible.) During freezing weather—where water has been drained to prevent freezing, **do not**

start the engine before drain plug has been installed in bottom of cylinder head and radiator filled with water. (Capacity of cooling system, 8 U. S. gallons.)

2. Check amount of fuel in front tank. Always use clean fuel of the type recommended for your tractor. See "Fuels", page 13. (Capacity of fuel tank, 16 U. S. gallons.)

Gasoline in the small rear tank is used for starting and warming up the engine. Fill with clean gasoline. (Capacity, 1 U. S. gallon.)

3. Check oil in the air cleaner for quality, weight, and amount. See recommendations, page 21.

4. Check crankcase oil level. If necessary, add a good grade of 10-W oil until oil runs out at the oil level cock. Note this oil must be drained after 20-hour "breaking-in" period and refilled with the weight of oil recommended in chart on page 21.

5. Check air pressure in pneumatic tires before moving the tractor. Inflate to correct pressure according to inflation chart, page 39. Tire inflation should be checked at least every two weeks.

TO START THE ENGINE

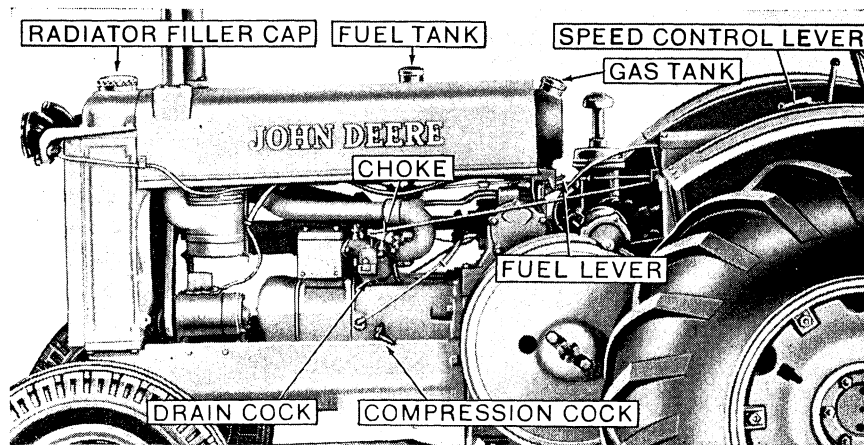


Figure 19—Controls Used in Starting Tractor

1. Close the radiator shutter, set the gear shift lever in neutral and pull the clutch lever back into the disengaged position.

2. Advance speed control lever halfway.

3. If the engine had been burning low-cost fuel when it was stopped, drain the carburetor.

4. If the carburetor adjustments have been changed, adjust load and idle needle according to instructions, page 30.

5. Turn on gasoline by turning the fuel control lever to the mark "G".
6. Open compression relief cocks.
7. Place choke in closed position. (For hand cranking, choking is done at the carburetor. With electric starter, choking is done by pulling choke button on battery box.)
8. For hand cranking, roll top of flywheel forward to start engine. With electric starter, pull starter button located on instrument panel.
9. As soon as engine fires, open choke immediately to prevent flooding.
10. With engine running with speed control lever in forward position, the hand of the oil pressure gauge must be between "M" and "H".
11. Close the compression relief cocks.
12. When heat indicator shows 180°F., turn fuel control lever to mark "F". DO NOT TURN ON FUEL BEFORE HEAT INDICATOR SHOWS 180°F. PROPER WARMING UP OF ENGINE IS ESSENTIAL FOR SATISFACTORY OPERATION OF TRACTOR ON FUEL.
13. Maintain an engine temperature of 190°F. by either opening or closing the radiator shutter.
14. Regulate engine speed by the speed control lever.
15. The engine is set to run at the correct speed when the tractor leaves the factory; 975 R.P.M. for full load and approximately 1075 R.P.M. for fast idle. **Caution:** UNDER NO CIRCUMSTANCES SHOULD THE ENGINE BE OPERATED AT AN IDLE SPEED OVER 1075 R.P.M.

Warm-Up Period.

Before you put your tractor on full load or into too high a gear, be sure it is warmed up (190°F.). This will give the oil a chance to circulate freely and will save undue wear on piston rings, cylinders, and bearings. Avoid racing the engine during the warm-up period because this wastes fuel.

OPERATING THE TRACTOR

Your John Deere Tractor has a range of speeds. These various speeds not only give you the flexibility and adaptability you want, but also they enable you to balance the load and the speed for maximum economy. However, if you are handling a light load and want to travel at slow speed, it is far better to put your tractor into the gear which gives you the speed you want than to use a higher gear and throttle down.

Driving the Tractor.

1. With the engine running, release the brake latch.
2. Pull the clutch lever back until pulley brake stops the pulley from rotating.

3. Shift the gear shift lever into the gear speed desired. If gears do not shift freely, move the clutch lever forward slightly, permitting the pulley to turn slowly. This allows gear teeth to line up for easy shifting. **SHIFT GEARS CAREFULLY. CLASHING GEARS CAUSE UNNECESSARY WEAR AND BREAKAGE. BE SURE THE GEAR SHIFT LEVER IS MOVED FAR ENOUGH TO PLACE GEARS IN FULL MESH.**

4. When gears are shifted, push clutch lever forward slowly until the tractor picks up speed, then give the clutch lever a quick forward thrust until the clutch snaps into engagement.

**A GOOD OPERATOR IS A SAFE
OPERATOR**

1. Reduce speed when turning or applying individual brakes.
2. Watch for obstructions. Be cautious near ditches or on steep hillsides.
3. Allow no riders unless seat is provided.
4. Never operate tractor unless power take-off is shielded.
5. Read and observe safety rules on pages 52 and 53.

High Speed Driving.

The purpose of the high speed in your tractor is to save you time on highways or on smooth-surfaced secondary roads and in going to and from your fields. Regardless of road or field conditions, use care in driving your tractor in high gear. Fast driving is the cause of many accidents. As a safety factor, shift to a lower gear, particularly over rough ground and save your tractor and tires from undue strain and possible breakage.

Caution: If your tractor is equipped with individual brakes, they should be adjusted evenly to avoid drawing the tractor to one side. However, independent brakes on your John Deere tractor enable you to correct or compensate for brakes that are not equally adjusted by merely changing the amount of foot pressure you apply.

Do not jam on brakes especially when one wheel is spinning because this suddenly throws a tremendous load on the transmission and can cause breakage.

Note: Reduce engine speed first before applying brakes.

Drawbar Load.

All drawn tools should be hitched to the drawbar. Do not draw or pull anything from any other place on the tractor.

When hitching the tractor to a heavy load by means of a long chain, take out any slack in the chain before the power is applied to eliminate jerking into the load.

Overloading.

Your tractor is designed and built to handle economically and efficiently all jobs within its range of power. To use your tractor on loads beyond its power range results in undue strain on all of its parts and will eventually result in unnecessary repair expense and impaired efficiency of operation.



Your tractor was designed to pull its normal load with the carburetor throttle lever near the three-quarter open position, but 20 to 25 percent of its power beyond the normal load is available to pull you through tough spots in the field or to clean out a belt machine that has been fed unevenly. As soon as the throttle reaches the full open position, you are using its full power. Beyond this, you are overloading your tractor. An overloaded tractor usually can be detected by a gradual slowing down in speed and a slowing down and laboring of the engine.

BELT WORK

Never leave the tractor running unattended when adjustments are being made on the driven machine, even though the clutch is disengaged.

Never use a stick to force a belt on or off a revolving pulley. To put on or take off belt, move tractor forward to provide slack. After backing tractor into belt, be sure the tractor is well blocked and both rear wheel brakes are locked. Always start a belt load slowly.

Note: After backing the tractor into the belt and setting brake latch, it may be difficult to get the gear shift lever into neutral. This is due to bind on the gear teeth caused by the pull of the belt. To relieve the bind, turn the belt pulley backward by pulling on the belt, after which the gears can be shifted easily into neutral.

Service Suggestions.

Regardless of how familiar you are with the type of equipment used with your tractor, take the time to study the recommendations made by the manufacturer in the instruction book that came with the equipment.

Safety Suggestions.

In your everyday work around farm equipment remember this: An accident is usually caused by someone's carelessness, neglect, or oversight. On pages 52 and 53 are safety rules which, if practiced, will make your farm safer for you and those who work with you.

STOPPING THE TRACTOR

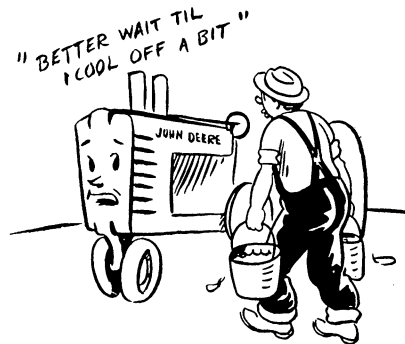
To stop the tractor, throttle engine down, disengage the clutch by pulling the clutch lever clear back. As soon as the clutch is disengaged, the brake can be used to bring the tractor to a full stop. **DO NOT USE THE PULLEY BRAKE TO STOP THE TRACTOR.** This shortens the life of the pulley brake lining.

To reduce wear on clutch facings, always place gear shift lever in neutral after disengaging clutch, and then re-engage clutch again if engine is idling. This is important.

If the tractor is burning low-cost fuel during the time the engine is idling, a more satisfactory engine temperature can be maintained more easily by closing the radiator shutter and placing the throttle lever in the half-open position.

STOPPING THE ENGINE

In cold or freezing weather, idle your tractor a few minutes before you stop it, to cool it off gradually. Sudden cooling of a hot engine causes extreme contraction of the heated metal parts. In freezing weather, never drain the water immediately after stopping, for the same reason. You are assured of better performance year in and year out if you follow this practice.



While there are several ways of stopping your tractor, there is only one correct way. By following this, you can be assured of easier starting.

To stop the engine, especially if it is burning the low-cost fuels, shut off the fuel at the fuel control lever and drain the carburetor bowl. This cuts off the fuel supply to the engine and, after a few revolutions, the engine will stop, leaving the combustion chambers dry—an important contribution to easy starting of the engine.

Caution: Do not stop the engine by shorting the magneto. To do so leaves unburned fuel in the cylinders, which will reliquefy as the engine cools and permit this liquid fuel to lay on the electrode and porcelain of the spark plugs to provide a path for the spark to escape and result in hard starting. Liquid fuel left in the combustion chamber will also wash the lubricating oil off the pistons, rings, and cylinders, thus breaking the oil seal and causing poor compression—also a factor in hard starting.

LUBRICATION

Effective lubrication of your tractor is perhaps the most important step towards low upkeep cost, long life, and satisfactory service, for without oil or grease you can ruin the important working parts of your tractor in a very few minutes' time in the field.

PURPOSE OF LUBRICATION

You use oil and grease in your tractor to separate metal parts that otherwise would work against one another. If properly lubricated, these parts never touch. Oil of the right weight acts much the same as tiny ball bearings to keep the wearing parts separated.

STORAGE OF LUBRICANTS

Your new tractor is equipped with various safeguards such as an air cleaner, oil filter, crankcase breather and ventilator—safeguards designed to keep dust, dirt, and other abrasives from reaching operating parts. You can increase the efficiency of these safeguards by using clean containers for storing and for handling all of the lubricants. See that only clean lubricants go into the working parts of your tractor.

ENGINE LUBRICATION

Quality of Oil.

The engine of this tractor, with its full force-feed pressure lubricating system, has one of the finest oiling systems it is possible to produce. Do not handicap it by trying to save money with cheap oil. High-grade oils withstand heat and wear for a longer time. Cheap oils soon become thin and lose their lubricating qualities.

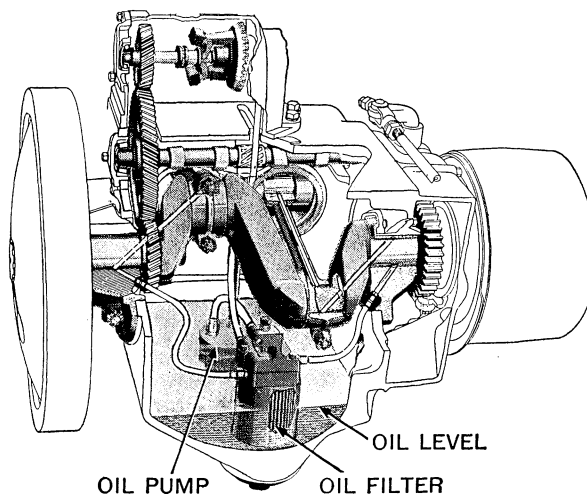


Figure 20—Lubrication System

It is impossible to determine the quality of oil by its appearance. As a result, inferior oil often is sold as a quality product at a lower price. It pays to buy only nationally-known, high-quality brands of oil. Don't take chances.

Weight of Oil.

Your John Deere tractor was made with the same precision as a fine automobile, with clearances between bearing surfaces as fine as a ten-thousandth part of an inch. If oil is expected to lubricate these surfaces, it first must get there. Therefore, weight or viscosity of the oil is very important.

As soon as oil of the correct weight and quality reaches bearing surfaces, it immediately begins functioning to relieve friction, carry off heat, to create an oil seal between rings and cylinders, thus preventing blow-by and loss of power, and last, to carry away elements such as carbon, dirt, and other abrasive materials that are harmful if left between metal working surfaces.

Oil of the wrong weight can result in loss of power, excessive fuel consumption, undue wear on moving parts, and eventual replacement of costly parts.

Remember this—the temperature in the crankcase correspondingly varies with the outside temperature. Therefore, it is important to use oil in the new engine according to the recommended temperature and weight chart below which has been scientifically worked out with leading oil companies.

<i>Air Temperature</i>	<i>Engine Crankcase and Air Cleaner</i>
Above 90° F.	S.A.E. 30
32° F. to 90° F.	S.A.E. 20-20W
Below 32° F.	S.A.E. 10W

NOTE: When temperatures remain below -10° F. for extended periods of time, improved engine performance will be obtained by using S.A.E. 5W motor oil. The engine will also be easier to crank which will result in less drain on the battery. S.A.E. 5W motor oil may also be used in the air cleaner under these conditions if desired.

CAUTION: Use of S.A.E. 5W motor oil will likely result in some increase in oil consumption. Check oil level more frequently when using this oil. Do not use S.A.E. 5W oil except during the extremely cold weather conditions specified above.

Crankcase oil capacity: 9 U. S. quarts, including oil filter compartment.

Break-In Period.

Regardless of whether you are using this new tractor in hot or cold weather, at the completion of the 20-hour breaking-in period, be sure to drain the crankcase oil and refill with new oil as specified in the chart above. This is important.

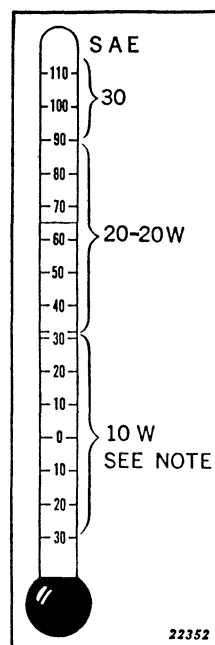


Figure 21—Chart Indicating Correct Weights of Oil to Use at Various Outdoor Temperatures

TRANSMISSION LUBRICATION

Lubrication of the transmission and differential is entirely automatic—it starts and stops with the engine. The differential and final drive gears are partially submerged in transmission oil and when they revolve, oil is carried up to all transmission parts, completely bathing gears, shafts, and bearings.

Changing seasons and temperatures, together with heating and cooling of the tractor, cause condensation and eventually an accumulation of water in the main transmission case. This water breaks down the lubricating quality of the oil and is one reason why transmission oil should be changed regularly.

Each spring the transmission should be drained and washed out.

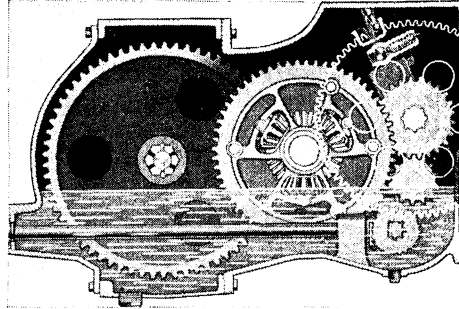


Figure 22—Transmission Lubrication

Weight of Oil

<i>Temperature</i>	<i>S.A.E. Viscosity Numbers</i>	<i>Oil Capacity, U. S. Measure</i>
0°F. and up	90	8 gal.
Below 0°F.	80	
(See Yearly Service)		

PERIODIC LUBRICATION SERVICE

10-HOUR SERVICE

At the end of each ten-hour run: (1) Check the oil level in the crankcase; (2) change the oil in air cleaner cup; (3) service crankcase breather core; and (4) service all grease fittings.

Note: If tractor is operated in extremely dirty conditions or operating at maximum load, it may be necessary to check and service your tractor at the end of five hours' run.

Checking Crankcase Oil Level.

If oil level in the crankcase is low, remove breather stack and filter core and add a good quality oil of the correct weight until it runs out of the oil level cock. For instructions on changing crankcase oil, see "120-Hour Service", page 25.

Servicing Air Cleaner.

The air cleaner is built into the tractor to prolong its life and usefulness by preventing dirt, sand, and grit from going into the engine, which will cause wear on all of the operating parts. The air cleaner requires attention every ten hours of operation.

To service—remove oil sediment cup from lower part of air cleaner; pour out oil and sediment. Wash out cup with distillate or kerosene. Refill cup to mark "Oil Level" with new engine oil.

Under extremely dusty conditions, service cleaner twice a day.

Note: Do not service air cleaner with engine running.

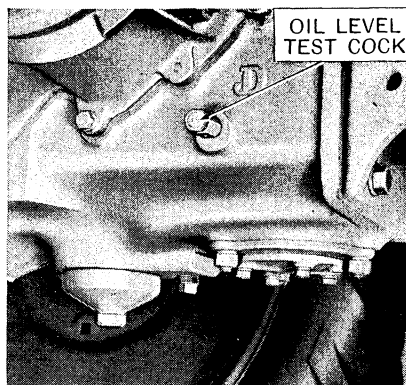


Figure 23—Location of Oil Level Test Cock

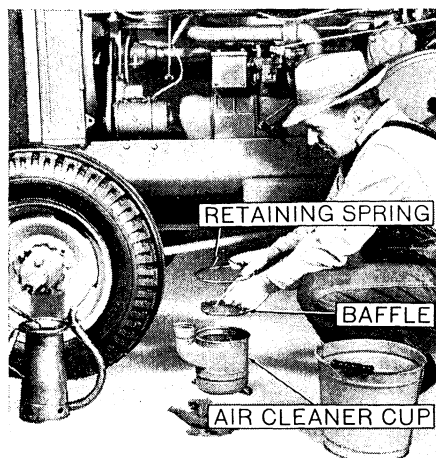


Figure 24—Air Cleaner Cup Removed

Servicing Crankcase Breather Core.

To service, remove stack, lift out filter core and wash it thoroughly. Shake core vigorously to remove fuel from core, and submerge in clean engine oil for five minutes until core is thoroughly soaked. Install breather core and replace stack.

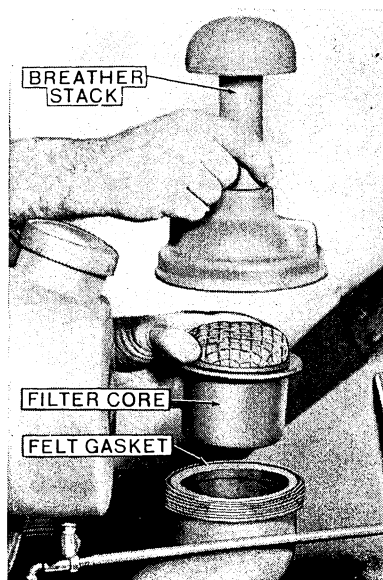
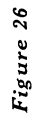


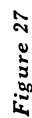
Figure 25—Removing Crankcase Breather Filter Core

Service all grease fittings with pressure-gun grease, wiping off fittings beforehand. Chart indicates amount of grease for each fitting.



If your tractor is equipped with electric starter or lighting equipment, the generator must be lubricated with 8 to 10 drops of light engine oil in each oil cup every 60 hours. Lubricate the generator when the tractor engine is stopped.

At the end of each 60-hour run, lubricate the generator. Read instructions below.



120-HOUR SERVICE

Changing the Engine Oil and Filter.

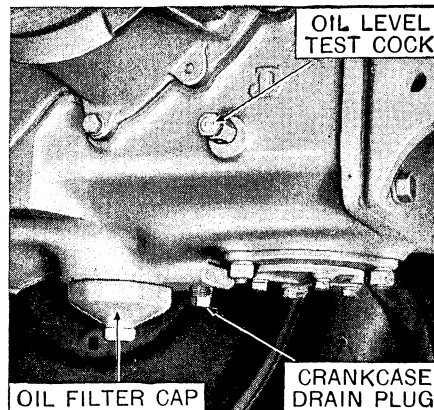
After completing 120 hours of tractor operation, the crankcase oil and the oil filter should be changed.

To drain the crankcase oil, simply remove the drain plug as shown in the illustration below. While the oil is draining, remove the oil filter cap, pull out the old filter and discard. See "Replacing Oil Filter" below.

Flushing Crankcase.

During a period of several months of operation, sludge may form in the crankcase and other foreign matter may collect on the engine parts. Make it a practice to flush the crankcase thoroughly at regular periods. Distillate serves as a good flushing and cleaning agent.

After draining out crankcase, pour in 1 gallon of flushing oil, run the engine a few seconds, then drain and change oil filter element. After the flushing oil has had a chance to drain out thoroughly and filter element has been changed, remove breather stack and filter core and pour in new oil of the proper weight until the oil drips out at the oil test cock. Close test cock. Be sure to add one extra quart of oil, which is necessary to replace oil drained out when the oil filter element was removed. This extra quart of oil will not run into the filter compartment until the engine starts. Total approximate crankcase capacity: 9 U. S. quarts.



*Figure 28—Crankcase Test Cock,
Drain Plug and Oil Filter Cap*

Replacing Oil Filter.

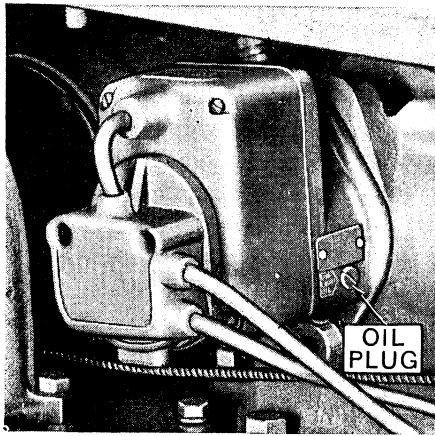
When you replace the crankcase oil, replace the old filter element with a new one. Notice the long stud over which the filter element fits. If it is bent out of center position, straighten it by tapping with a soft hammer. If the rubber gasket that seals the filter cap becomes damaged, oil will leak at the cap. Remove the old gasket, using an ice pick or some

similar tool, and replace gasket with a new one. Draw filter cap up snug. Damage may result from over-tightening.

Always have replacement filter elements on hand so that there will be no reason for using an element **more than 120 hours**.

Note: John Deere engineers have made exhaustive tests on all types, makes, and kinds of oil filters to find the filter which would keep the oil free from contamination for the longest operating period. These tests have proved that the replacement oil filter recommended and supplied by your John Deere dealer is the most effective.

500-HOUR SERVICE



*Figure 29—Magneto
(Wico Type "C")*

At the end of each 500-hour run: lubricate the magneto and, if your tractor is so equipped, the individual brakes.

Magneto (Wico Type "C").

Lubricate the magneto by removing the oil plug and filling the oil compartment with a good quality of S.A.E. 20-20W oil. Lubricate the magneto when the engine is stopped.

Caution: *Overlubricating has damaged more magnetos than not enough lubrication. Follow directions for best results.*

Magneto (Wico Type "X").

No lubrication required.

Brakes.

Individual brakes are lubricated with new engine oil, same weight as used in the crankcase. Fill each brake bearing oil cup to overflowing.

A few drops of light engine oil placed on the brake pedal shaft, where the shaft enters into the main housing, will prevent the foot pedal from sticking and improve the brake pedal action.

YEARLY SERVICE

Changing Transmission Oil.

Drain, flush, and refill the transmission with high-quality transmission oil at least once a year, preferably before the spring work begins. To do a thorough job of draining, remove both transmission and rear axle drain plugs.

Flushing Transmission Case.

To flush case, after draining out old oil, replace plugs, add 3 gallons of flushing oil. Then jack up one rear wheel, start the engine, shift into gear and engage clutch. Run for a few minutes, then drain. Add transmission oil of the proper weight. See table, page 22.

Cold Weather Operation.

If your tractor will be used extensively during extremely cold weather and it has S.A.E. 90 oil in the transmission, drain the transmission and put in a good quality S.A.E. 80 oil. Change to S.A.E. 90 oil again in the spring. (Oil capacity is 8 U. S. gallons.)

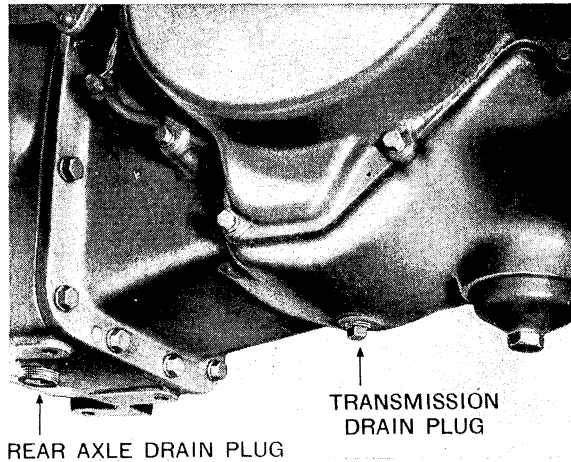


Figure 30—Rear Axle Housing and Transmission Drain Plugs

Only Genuine John Deere Replacement
Parts Fit and Wear Like the Originals

YEARLY SERVICE YOUR JOHN DEERE DEALER OFFERS.

YOUR JOHN DEERE DEALER OFFERS A YEARLY, COMPLETE TRACTOR SERVICE AT A NOMINAL CHARGE. TAKE ADVANTAGE OF THIS SERVICE AS IT INCLUDES, AMONG MANY OTHER THINGS, THE FOLLOWING LUBRICATION SERVICES WHICH SHOULD BE DONE EACH YEAR.

Front Wheel Bearings.

Front wheels will be removed and all parts, including wheel hub, will be washed clean, removing the old grease. The bearings, felt washers, and felt retainers will be inspected for wear and replaced if worn. Wheel hubs and bearings will be packed with grease, assembled, and adjusted.

Front Fan Bearings.

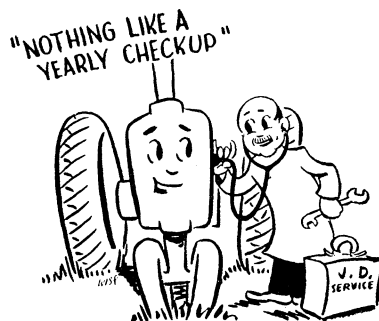
Front fan shaft assembly will be removed, disassembled, and all parts will be washed clean, removing the old grease. The bearings, felt retainers, washers, fan shaft, gears, spring, and fan will be inspected for wear and parts replaced if worn. This assembly will be repacked in high-temperature grease and assembled.

Pulley and Clutch Bearings.

The clutch and pulley will be removed; bearing and oil return holes in pulley hub will be washed clean. Bearing, bushing, and all clutch parts will be inspected for wear and parts will be replaced if worn. Bearing will be repacked in high-temperature grease, the pulley and clutch assembled and adjusted.

Steering Spindle Bearings.

Front steering spindle will be removed, lower bearing washed and inspected for wear and replaced if worn. Bearing will be packed with grease, assembled and steering assembly adjusted.



SERVICE THAT WILL KEEP YOUR TRACTOR IN TIP-TOP SHAPE

Operating economy and long life have been characteristics of John Deere tractors ever since the first one was built back in 1924. Fundamentally, these characteristics have been built into each tractor in the form of heavy, rugged parts, simplicity, and ability to burn a variety of fuels.

However, economy and long life are affected by almost all phases of tractor care and operation. The choice of speed, the load you pull, the selection of fuel, the temperature, lubrication, adjustments, and general conditions—all have their bearing upon the economy and long life you can expect from your tractor.

There are certain service jobs that should be done before you operate your tractor, during its operation, and after your season's work has been finished. By making it a hard and fast rule to follow a servicing routine, your tractor will run better, last longer with less upkeep expense; you will eliminate field delays, and will get your work done quicker and easier.

There may be rush seasons of the year when it is practically impossible to follow to the letter all of the servicing suggestions made in this manual. However, at the first opportunity, do the servicing job that has been neglected temporarily so that your tractor will be in tiptop shape when you need it again.

The following suggestions cover adjustments and servicing which may involve merely inspection, but if necessary, adjusting or servicing of these various units should be made either by you or your John Deere dealer.

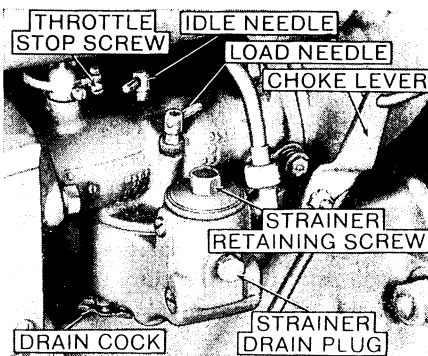
FUEL SYSTEM

Inspection of Fuel System.

Uniform efficiency of the fuel system will be assured by an occasional inspection and cleaning, if necessary. The logical place to start is the source of fuel supply—the fuel tank.

First, shut off the fuel at the fuel filter by turning the shut-off valve to the horizontal position. Then remove glass bowl and clean thoroughly. With glass bowl removed, turn the shut-off valve to the vertical position to see if fuel flows readily from the tank. If not, tank must be cleaned. When replacing the filter bowl, be sure the cork gasket which fits between the bowl and screen is in good condition; if not, renew it. All fuel lines should be checked.

To clean the carburetor strainer assembly, remove strainer retaining screw and drain plug and flush strainer housing by turning on fuel. Replace strainer screen assembly by screwing up tight with fingers and tightening it one-half turn with wrench. If fuel leaks at strainer assembly, install a new gasket.



Adjusting the Carburetor.

Figure 31—Carburetor

The carburetor mixes liquid fuel and air together to form a fuel vapor. The carburetor is provided with adjustments for smooth engine operation, fuel economy, and maximum power.

In making carburetor adjustments, the engine must be warmed up first. Then, with the speed control lever in the fast idle position, adjust the idle needle until the engine runs evenly. In warm weather, this varies from 1-1/2 to 1-3/4 turns on low-cost fuel and slightly less on gasoline. This setting may vary on individual tractors, and when once made, should not be changed unless a different fuel is used.

For all-around maximum economy, apply a load (belt load preferred) to the engine which will operate the carburetor throttle lever in approximately the 3/4 open position. Adjust the load needle, turning it down until the engine loses power or backfires, then open one, two, or three notches—whichever gives desired performance. In warm weather, this should leave load needle open approximately 3/4 to 1 turn on low-cost fuel and slightly less on gasoline. This adjustment will give best economy for all loads and should not be changed unless cold weather causes a lean mixture or a change has been made in the fuel used.

If governor closes throttle entirely when load is released to cause uneven running, screw the throttle lever stop screw in against stop spring until tractor idles satisfactorily.

CAUTION: CARBURETOR SHOULD NOT BE ADJUSTED WHILE TRACTOR IS MOVING.

For carburetor service, see your John Deere dealer.

IGNITION SYSTEM

The entire ignition system—which consists of a magneto, two spark plugs, and two spark plug cables—must function efficiently to get first-class performance and maximum operating efficiency from your tractor.

Check the Ignition System Periodically.

If necessary: (1) clean and adjust the spark plugs; (2) hone and adjust the magneto breaker points; (3) check ignition timing; (4) inspect the spark plug cables for breaks or shorts.

Spark Plugs.

There are two things that will cause a grounded electric current through the spark plugs—a heavy coating of carbon and a cracked porcelain. If the plug is dirty, scrape or clean the plug. If the porcelain is cracked, the plug must be replaced. Check electrode gap and see that it is spaced to .030-inch. In adjusting the gap, bend only the outer electrode. Always use a feeler gauge to get correct setting.



To prolong the life of the spark plug, be sure to install the gasket which is provided with all new plugs. If the plug is tight against the gasket, the heat is permitted to escape from the plug through the gasket into the water jacket of the cylinder block, insuring longer life of the plug.

To obtain the best performance and to secure maximum efficiency from the engine, use only size 18mm. Champion No. 8 Com. C spark plugs.

Spark Plug Cables.

Keep cables clean to prevent shorting. Under certain weather conditions, cables may eventually become hard and cracked and require replacement. The cable terminals should fit snugly in the socket of the distributor cap of the magneto. Be sure each cable is securely fastened to the spark plug terminal.

Magneto Distributor.

If you are experiencing ignition trouble, first check spark plugs and spark plug cables. If these are in good condition, only then remove the distributor cap and check the magneto.

After removing the distributor cap, wipe it out thoroughly with a clean rag and be sure that ventilator holes are open. Inspect the cap carefully and if cracks are found, replace with a new one.

Remove the distributor arm from the shaft by pulling straight out, then wipe arm and cam clean. If on examination you find breaker points are worn,

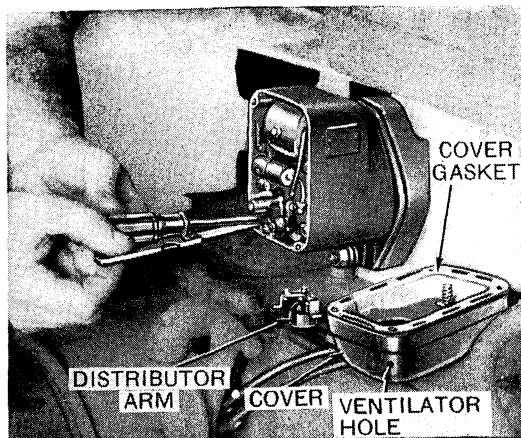


Figure 32—Adjusting Breaker Point Gap

pitted, or dirty, carefully remove both points from the magneto. After cleaning the points, hone each point to a smooth, flat surface, using a fine hone. (If points are badly pitted or worn, they should be replaced with a set of new genuine breaker points.)

Then install the points in magneto and turn flywheel until the cam is in position as shown in Figure 32. Adjust the points to a gap of .015-inch. Examine the breaker bar for free movement.

Replace the distributor arm and distributor cap. Make sure the gasket is in place and in good condition. Replace cables, upper terminal to spark plug on flywheel side and lower terminal to spark plug on pulley side.

These simple operations will locate and correct all ordinary magneto troubles. If no spark is obtained after these operations are completed, the magneto should be removed and taken to your John Deere dealer who has the facilities for checking and overhauling it.

Installing Magneto on Tractor.

Installing the magneto after it has been removed from the tractor can be done easily as follows: First, remove the spark plug on the flywheel side. Place your finger over the hole and rotate the flywheel in the running direction until you feel a pressure of air in the cylinder. Continue turning the flywheel slowly until the "L. H. Impulse" mark, stamped on the flywheel, lines with timing mark on the tractor. (See Figure 33.) In this position the slot in the coupling on the governor shaft will be horizontal. Figure 34.

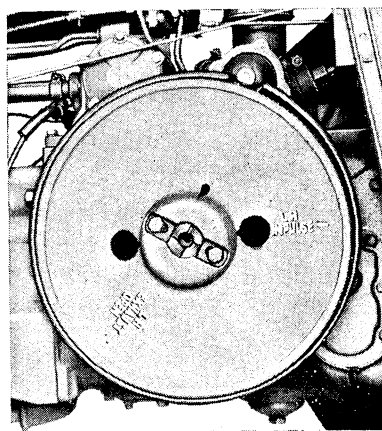


Figure 33—Timing Marks

Next, secure a short piece of wire and insert one end in the upper terminal of the distributor cap on the magneto, bend the other end around to within 1/8-inch of some metal part on the magneto frame. Hold the magneto solidly in the same upright position as when mounted on the tractor.

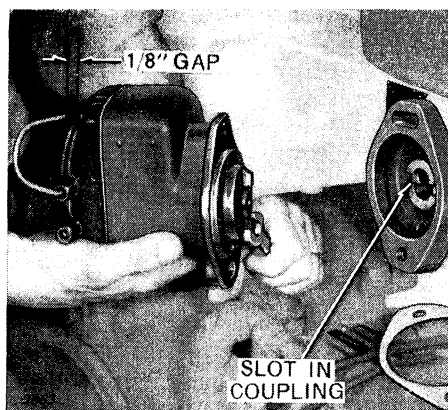


Figure 34—Magnetos Timing

gasket must be used between bolting flanges. After tightening the two cap screws firmly with the fingers, rotate the top of magneto toward front of tractor as far as possible. Then rotate the flywheel one complete turn and line the flywheel mark "L. H. Impulse" exactly with the timing mark on the tractor. Now tap the top of the magneto toward the rear of the tractor a little at a time until the impulse trips.

Tighten cap screw holding magneto to governor case and install spark plug cables. Left-hand spark plug cable must be installed in upper distributor cap terminal.

CAUTION: WHENEVER ADJUSTMENTS ARE MADE ON THE TRACTOR ENGINE, REMOVE THE SPARK PLUG CABLES FROM SPARK PLUGS AND GROUND CABLE ENDS TO PREVENT ACCIDENTAL STARTING.

COOLING SYSTEM

Your new tractor engine is water-cooled by the thermo-siphon cooling system—an automatic circulation system which eliminates the need for both a water pump and thermostat.

The circulation is governed automatically by the requirements of the engine. This system not only gives a more uniform engine temperature, but also eliminates delays in the field.

Engine Temperature.

In order to compensate for varying loads and changing weather conditions, your tractor is equipped with a radiator shutter. The shutter is conveniently operated from the tractor seat. It is highly important to

Grip the driving lug on the impulse coupling firmly and turn the impulse slowly in a left-hand direction (counter-clockwise). Stop instantly when impulse trips and spark occurs between end of wire and magneto frame. When impulse trips, driving lugs on the impulse coupling will be in a horizontal position.

Replace magneto and gasket on the governor case, making sure the impulse coupling lugs engage slots on the governor drive coupling. A

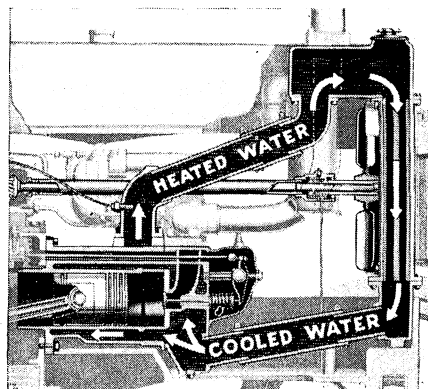


Figure 35—Cooling System

maintain an engine temperature of at least 190°F., as indicated on gauge, to insure complete burning of the fuel, greater economy, better lubrication, and steady power.

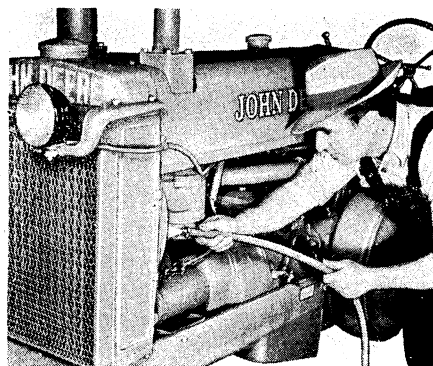


Figure 36—Cleaning the Radiator

Cleaning the Cooling System.

Efficient operation of the cooling system calls for an occasional cleaning just like the radiator of your car or truck. Clean the radiator as follows:

Run the engine for a few minutes to stir up any rust or sediment. Stop the engine and drain the cooling system completely before sediment settles again. Replace drain plug and fill the cooling system with a solution composed of one pound of washing soda per gallon of water. (Cooling system capacity—8 U. S. gallons.) Install the filler cap and run the engine for half an hour. Then drain out the solution, add fresh water, start the engine, and let the water circulate for a few minutes. Stop the engine and drain out this flushing water. Fill with fresh water up to baffle. Following this procedure once or twice a year will keep the inside of the cooling system operating efficiently.

In order to do a thorough job of cleaning the cooling system, the radiator shutter should be removed in order to examine all air passages in radiator core, remove all chaff and dirt and straighten bent fins.

In filling the radiator, soft water should be used whenever available. Well water often contains lime and other minerals which eventually may clog the radiator cores and reduce the cooling efficiency.

Cold Weather Operation.

In using the tractor regularly in freezing weather, an anti-freeze solution will eliminate filling and draining the radiator daily. **This mixture should have a boiling point of not less than 212°F.**

If you operate your tractor only occasionally in freezing weather, you can use water only and drain the radiator each time.

Caution: Do not put hot water in a cold engine or cold water in a hot engine at any time. You may crack the head or cylinder block. Do not operate the tractor without water for even a few minutes.

CLUTCH

Through the medium of the clutch on your tractor, the power of the engine is transferred to the transmission. With the simple forward movement of the clutch lever, you engage the clutch, and the power of the engine is transferred to the drive wheels or to the belt pulley.

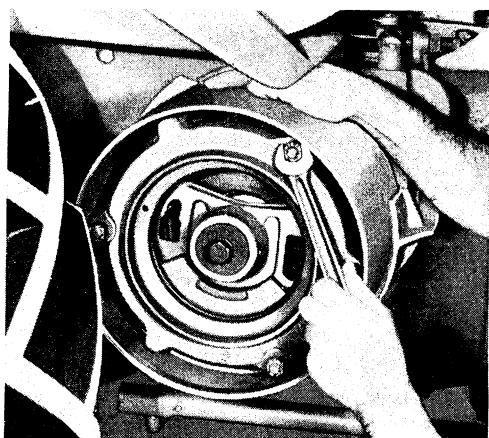


Figure 37—Adjusting Clutch

The adjustment of the clutch determines whether or not you get maximum power developed by the engine to the drive wheels. A loose clutch, one which requires little or no effort to engage, will slip, causing loss of power, overheating of the clutch and pulley, and will result in early replacement of clutch facings.

Adjusting the Clutch.

To adjust the clutch, first set the clutch lever in the engaged position; then, remove pulley cover; tighten each of the three nuts a little at a time to an equal tension. This you can determine by the effort required to turn the nuts. Now, try the clutch lever. It should go into engaged or operating position with a snap requiring some pressure.

Replacing Clutch Facings.

To replace the clutch facings first study Figure 39 because it shows the arrangement of parts. Be sure that they are replaced in the order as shown.

Two half-inch machine bolts and nuts can be used as a puller for removing the driving disk from the crankshaft. **Caution:** Revolve pulley so that ends of bolts do not rest on swedged head of clutch cone drive pin when bolts are tightened.

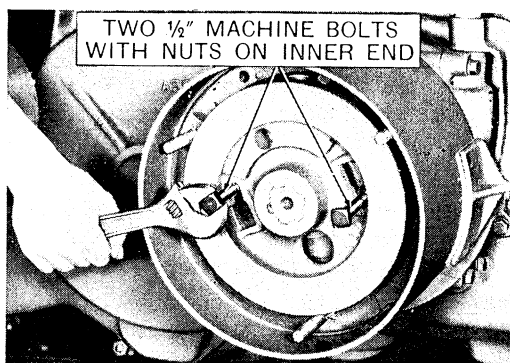


Figure 38—Removal of Driving Disk from Crankshaft

In replacing, be sure rivet in driving disk hub lines up with the flat spot at end of one of the crankshaft splines. The cap screw holding the driving disk on the crankshaft must be **tight**.

After installing the new facings and all other parts, adjust the clutch as described previously.

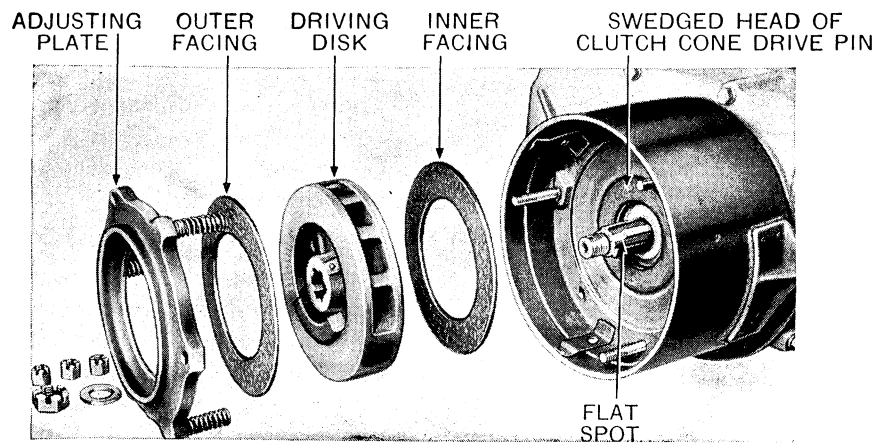


Figure 39—Clutch Parts Removed

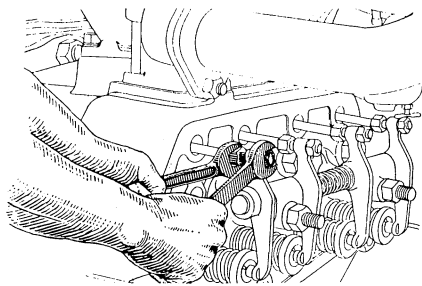


Figure 40—Tappet Adjustment

TAPPET ADJUSTMENT

When properly adjusted, tappets will seldom need attention. However, an occasional checking is advisable. All adjustments should be made with a cold engine.

Adjusting the Tappets.

To adjust the tappets, remove the tappet cover from the front of the cylinder head and both spark plugs from the cylinders. Turn the flywheel until the piston on flywheel side is at the end of the compression stroke. Now adjust the two left-hand tappets. To adjust the two right-hand tappets, the flywheel must again be turned until the piston on pulley side is at the end of the compression stroke. Then adjust the two right-hand tappets.

Tappets are adjusted by turning the adjusting screws in until there is no movement in the tappet levers; then turn the adjusting screw out $1/3$ turn, or until there is .020-inch clearance between the end of the tappet lever and valve stem. A feeler gauge will eliminate guesswork.

After each adjustment is made, lock tight the adjusting nut. In replacing the tappet cover, use a good gasket.

SERVICE BRAKE

Service brake is adjusted by tightening nut on end of brake band.

Care should be taken that the nut is not tightened enough to cause band to drag on drum.

Be sure that band conforms to shape of drum.

Brake band may easily be removed for relining.

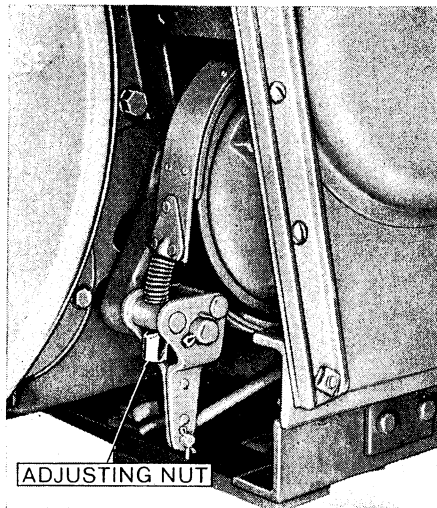


Figure 41—Service Brake

Adjustment.

To adjust the brakes, tighten the adjusting screw, then back off five notches. This adjustment should permit about 2-3/4- to 3-1/4-inch pedal movement before you feel the brake shoe contacting the drum.

Whenever a brake adjustment will not correct or improve defective brake action, have the brakes relined.

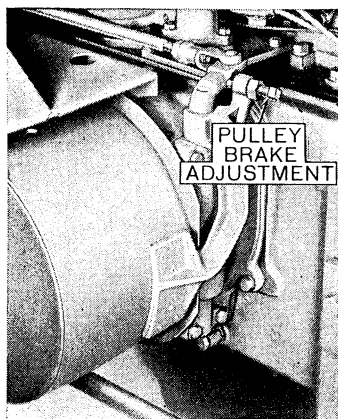


Figure 43—Pulley Brake Adjustment

INDIVIDUAL BRAKES

Foot-operated individual brakes have three important purposes: Used separately, the tractor can be turned extremely short to right or left; Used together, they act as emergency brakes on hills or grades; Locked by means of latches provided, they hold the tractor into the belt.

Operating the Brakes.

Pressure should be applied gradually, particularly when traveling in high speed or under icy or muddy conditions where the wheels are inclined to spin.

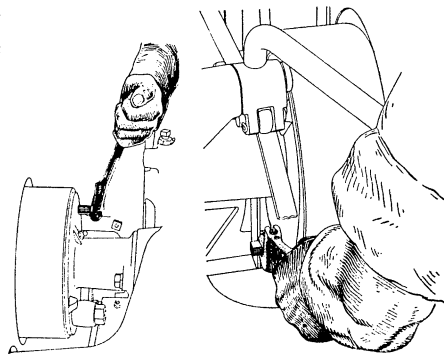


Figure 42—Individual Brake Adjustment

PULLEY BRAKE

The purpose of the pulley brake on the clutch lever assembly is to stop the pulley from rotating when lever is pulled back, thus making it easy to shift gears. **Caution:** Do not use the pulley brake to stop the tractor; this shortens the life of the pulley brake lining.

Adjustments.

To adjust the pulley brake, loosen the brake adjusting screw lock nut and turn in the adjusting screw until the brake keeps the

pulley from turning when the clutch is disengaged and clutch lever is held back. Then tighten the lock nut.

Note: After backing the tractor into the belt and setting each brake latch, it may be difficult to get the gear shift lever into neutral. This is due to binding on the gear teeth caused by the tightness of the belt. To relieve binding, turn the belt pulley backward by pulling on the belt. The gears then can be shifted easily into neutral.

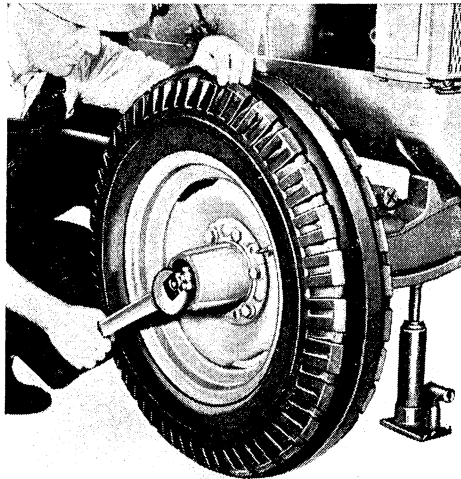


Figure 44—Front Wheel Bearing Adjustment

First, remove the hub cap and cotter key and loosen the lock screw. With a 12-inch wrench, draw adjusting nut up tight. If any other length wrench is used, draw the adjusting nut up until a slight drag is felt when the wheel is rotated. (If the adjusting nut is turned 3 to 4 castellations before it is drawn tight, the wheel should be disassembled and bearings inspected.) After adjusting nut is drawn tight, back it off one full castellation, plus any additional amount required for inserting the cotter key. Install cotter key, tighten lock screw and replace hub cap. Both wheels must be adjusted alike.

Caution: Care must be used that drag caused by the dust excluding felts is not mistaken for drag caused by bearings.

Tie Rod Adjustment.

The tie rod on front axle should be adjusted to permit a 1/2- to 3/4-inch toe-in of front wheels.

When Should Wheels Be Removed?

At least once a year the front wheels should be removed and all parts of hub and spindle washed clean to remove dirt and the old grease. Examine the bearings, felt washers, and felt retainers and replace if worn.

If bearings are removed, new felt retainers must be used when reassembling.

FRONT WHEEL BEARINGS

The front wheels on your tractor are carried on tapered roller bearings that must be kept in adjustment to assure long bearing life. Twice a year check the front wheels for end play. Raise the wheels off the ground and if end play is evident, the bearings need adjustment.

Adjustment.

First, remove the hub cap and cotter key and loosen the lock

TIRE INFLATION

It is important to maintain the proper tire pressure under all conditions. The life of rubber tires can be affected materially by both under and overinflation.

Underinflation.

This condition may cause the tire to slip on the rim and tear out valve stems or buckling of the sidewalls, fabric breaks and uneven tire wear.

In plowing, because of the change in weight distribution, the furrow wheel tire usually requires more air than the land wheel tire. Observe the tire from the tractor seat under actual operating conditions. If the tire buckles or wrinkles, increase the tire pressure. (See tire inflation recommendations.)



Properly Inflated



Overinflated



Underinflated

Overinflation.

Overinflation reduces traction, increases wheel slippage, and results in excessive tread wear and fuel consumption.

RUBBER TIRE INFLATION CHART

Rear Tires

Tire	Ply	Inflation Pressure Without Added Wheel Weight	Maximum Permissible Additional Weight per Wheel at Maximum Recommended Inflation Pressure
<i>Tractor equipped with Cast Wheels:</i>			
13-26	6	12 lbs.	1750 at 20 lbs.

WHEN PLOWING, INCREASE PRESSURE IN FURROW REAR TIRE 4 LBS.

When using mounted implements, consult implement instructions for tire pressures.

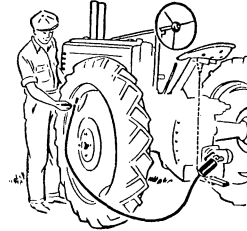
Front Tires

4-Ply — 28 lbs.

Checking Air Pressure.

Air pressures should be checked every two or three weeks and should not be allowed to drop below the recommendations as shown in the chart on page 39. A special low-pressure gauge, with one pound graduations, is necessary in order to get accurate inflation. This gauge should be checked occasionally for accuracy. It may get out of order requiring a correction in the reading.

A special air-water gauge should be secured for testing tires filled with water or calcium chloride solution.

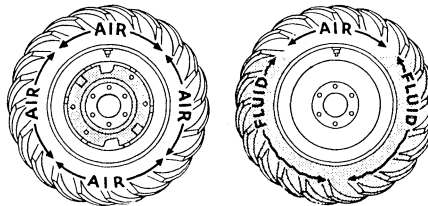


Always replace the screw valve caps and be sure they are on tight to provide a positive air seal.

In the third column of the rubber tire inflation chart are shown minimum air pressures. If additional traction is required, add weight to the wheels. Lowering the air pressure will make little difference in the traction and may ruin the tires.

WEIGHTING REAR WHEELS

Rear wheel equipped with removable cast-iron wheel weight



Tractor tire with liquid in tube as wheel weight

Why Use Wheel Weights?

Power can be lost in the field and tire life cut drastically by wheel slippage. Wheel slippage can be largely corrected by weighting the rear wheels either by a liquid solution in the tires or by adding cast-iron wheel weights.

Extra weight is needed only for heavy pulling. It is not required for road operation and light work such as planting, harrowing, or cultivating, or when heavy equipment is mounted on the tractor.

Liquid Weight.

Water and calcium chloride solution is an economical means of adding weight to rear wheels equipped with rubber tires. This solution will not damage the inner tube or tire if used in proper proportions and its use has

the full approval of the tire companies. Calcium chloride solution is recommended rather than water as it will not freeze. (See your John Deere dealer for this service.)

Cast-Iron Weights.

Where weight in addition to the liquid weight is required or where weight other than a liquid solution is desirable, cast-iron wheel weights, each weighing approximately 150 pounds, can be bolted to the rear wheels. This type of weight can be secured from your John Deere dealer.

In plowing, best results are generally obtained by taking one weight from the furrow wheel and adding it to the land wheel. The tilting of the tractor in plowing throws additional weight on the furrow wheel. Furthermore, the traction in the furrow is usually better than that on unplowed land. By adding weight to the land wheel, there is more uniform distribution of weight over the drive wheels, which is important.

CARE OF RUBBER TIRES

Grease and Oil Shorten Rubber Tire Life.

Tires should not stand on oil-soaked floors and should not come in contact with fuel or oil. Oil softens and deteriorates the rubber, shortening the life of the tires.

Sunlight Shortens Rubber Tire Life.

Bright sunlight causes the surface of the tires to check and harden. When not in use, keep tractor out of the sun if possible. When it is to be stored for any length of time, store it in a cool, dark place, with the tires relieved of their load by jacking up the tractor. If the tractor is stored in the open, it should be covered with canvas or some other suitable material.

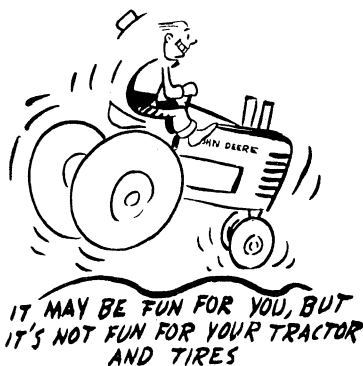
Chemicals Shorten Rubber Tire Life.

When using a tractor in spraying and dusting operations, especially with Paris Green and Bordeaux mixtures which contain copper, the tires should be cleaned thoroughly with clean water after each spraying operation.

Careless Driving Shortens Rubber Tire Life.

Driving over rough ground at high speed puts an undue strain on fabric and very definitely shortens tire life. Driving over rocks, stones, tree stumps, etc., is hard on tires.

If your tires frequently run over objects which would pierce them, such as citrus tree thorns, cactus, and certain kinds of stubble, a heavy inner liner should be used between the tire and the tube. This will prevent most punctures. Get inner liners from a tire dealer.



Inspecting Tires.

Inspect your tires at regular intervals for possible injuries. The sidewall or tread rubber may be cut through, exposing the fabric so that moisture and dirt can get in and cause rotting of the fabric. There are rubber compounds on the market for filling these cuts. If the break is more than 2 inches long, have it vulcanized for permanency. Your John Deere dealer may be able to do this for you.

DRAWBAR

All drawn equipment should be hitched only to the drawbar.

The drawbar is provided with two main adjustments which, together with adjustments provided on the plow or other drawn equipment, enable the operator to obtain a

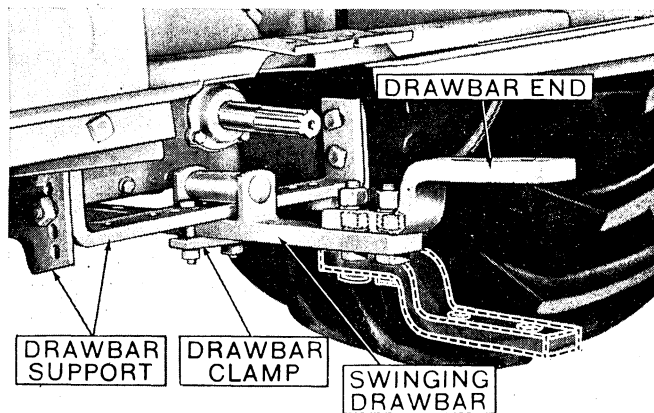


Figure 45—Drawbar

correct line of draft. Correct line of draft is essential for greatest amount of drawbar pull, easy steering, and least amount of rear wheel slippage.

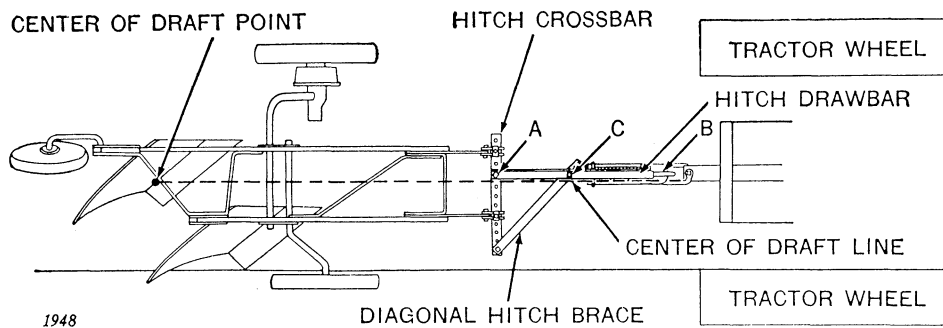


Figure 46—Horizontal Drawbar Adjustment

Horizontal Adjustment.

The crossbar upon which the swinging drawbar swings has a series of holes which are used for locking the swinging drawbar in any one of a number of fixed horizontal positions. Bolts or pins dropped in the holes on both sides of the swinging drawbar will hold it in place.

For plowing, locate the center of load and attach tractor to plow with a correct line of draft. (See Figure 46.) The plow drawbar from "A" to "B" should be about parallel with the line of travel. The swinging drawbar should be locked in position for plowing.

Note: To find the center of load: First, find total cut of plow. Half of total cut is center of cut. Measure to left of center of cut $\frac{1}{4}$ the width of cut of one bottom to get **center of load**.

When power shaft is used, set swinging drawbar in line vertically with center of power shaft. The drawbar height should be adjusted so that the hitch hole is about six inches below the power shaft center.

Drawbar should be secured with clamp as shown in Fig. 45.

For disking, harrowing, and other similar work where it is necessary to turn corners under load, the drawbar should be free to swing.

Vertical Adjustment.

Due to variable land conditions and variable heights of hitch points on tractor-drawn implements, the drawbar may have to be raised or lowered to obtain maximum traction and effective steering. Two vertical adjustments are provided. If necessary, swinging drawbar end can be turned over for adjustment. (See Figure 45.)

If the tractor drawbar at "B" (Fig. 47) is placed too high, the pull of the drawn implement unbalances the tractor pulling down on rear end and up on front which causes difficult steering. This frequently occurs when plowing uphill and under these conditions the tractor drawbar should be lowered.

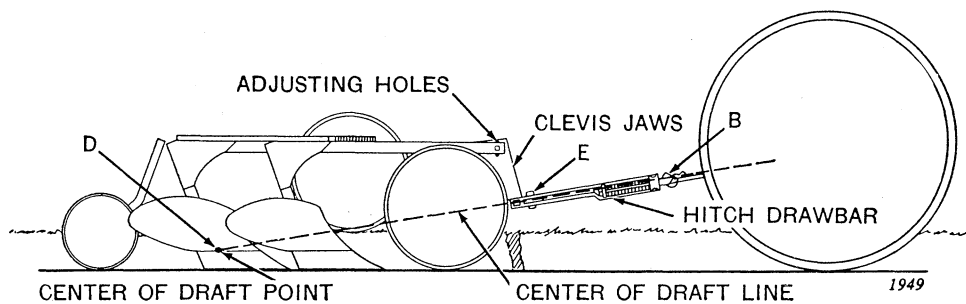


Figure 47—Vertical Drawbar Adjustment

If the tractor drawbar is too low, it tends to raise the rear wheels causing wheel slippage and loss of power at the drawbar. This frequently occurs when drawing equipment with higher hitch points than the tractor drawbar. The tractor drawbar should be raised to secure traction.

The above figure illustrates the correct vertical hitch adjustment for tractor-drawn plows. The hitch is in line with line of draft as shown by dotted line between "B", the hitch point, and "D", the center of load.

The correct hitch at "E" is the place where "E" is in a true line between point of hitch "B" and the center of the load "D" on the plow.

STARTING AND LIGHTING EQUIPMENT

If your tractor is equipped with electric starter or lights, follow the simple precautions and service operations below for maximum satisfaction.

THE STORAGE BATTERY

The battery is used for storing chemical energy which is converted into electrical energy whenever you demand the use of the starting motor or lights. For the battery to continually perform these functions, it is necessary that current withdrawals be replaced by current from the generator.

When replacing the battery on tractor equipped with electric starter and lights use one 6-volt battery having not less than 15 plates, 115 ampere-hour minimum capacity with the following over-all dimensions which are maximum: 10-3/8" long, 7-1/16" wide, 9-5/16" high over terminals.

Insist on a heavy-duty battery with a rubber case and "anti-leak" battery caps.

Battery life will depend upon how conscientiously you adhere to the following suggestions.

Cleaning Battery.

At least once a week wipe off the top of the battery with a cloth dampened with water. If corrosion is present around the terminal connections, loosen it up with a stiff bristle brush and then apply a solution consisting of 1/4 pound of soda added to one quart of water. Then flush the battery with clear water. After cleaning, examine the vent holes in each cap, making sure they are open. Battery connections must be clean as well as tight. A thorough coating of vaseline on each terminal connection will greatly aid in retarding the accumulation of corrosion.

Checking Water Level.

Check the electrolyte (acid and water solution) in the battery for proper level. If the electrolyte level is low, add distilled water or any water that you would be willing to drink, until the level recommended is reached. As this level varies in batteries made by different manufacturers, consult the dealer from whom you purchased the battery. The electrolyte level, however, should never be permitted to go lower than the top of the cell plates. In freezing weather, do not add water until after the engine has started, as water will not mix with the electrolyte until the generator passes a charging current into the battery.

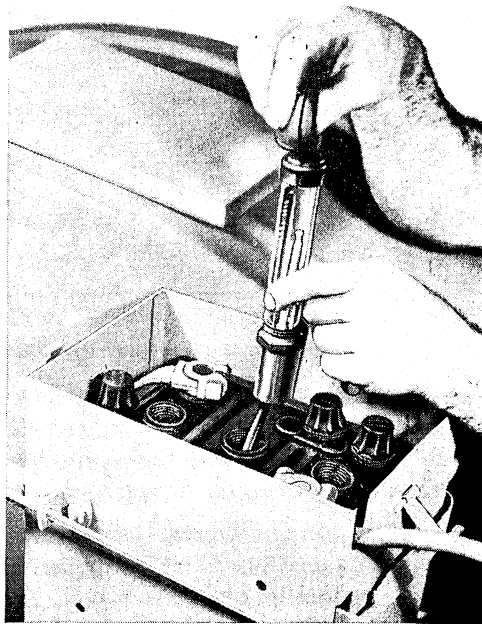


Figure 48—Taking Hydrometer Reading of Battery

Checking Specific Gravity.

The specific gravity of the electrolyte should be checked with an accurate hydrometer before adding water. If liquid level is too low to check, add water, run the engine for a few minutes—permitting the water and electrolyte to mix—then check. In freezing weather, water should be added only prior to operating tractor. Specific gravity should not go below 1.225 which is half charge. When fully charged, the reading will be 1.280 to 1.300. **Note:** Because temperature affects batteries, some manufacturers make a special battery for tropical areas. The specific gravity reading on a fully-charged tropical battery will be between 1.210 and 1.230.

Cold Weather Operation.

If the tractor is not used enough in cold weather to maintain specific gravity of the battery electrolyte above half-charge, the battery should be removed to a cool place (above freezing) and should be checked and recharged every thirty days to prevent damage to the plates.

Caution: If necessary to operate the tractor without the battery, remove the field wire from the generator terminal marked "F" on the generator frame; otherwise, the generator will be damaged. Do not place battery on a concrete floor, as cold concrete tends to draw strength from the battery. Where the temperature drops below freezing, precautions should be taken to avoid damage to the cells from freezing. A badly discharged battery freezes more quickly than one that is well charged. For example, a battery with a specific gravity reading of 1.175 (discharged) will freeze at 4°F., and a battery with a specific gravity reading 1.300 (fully charged) will not freeze until temperature reaches—95°F. Freezing weather will not damage charged batteries.

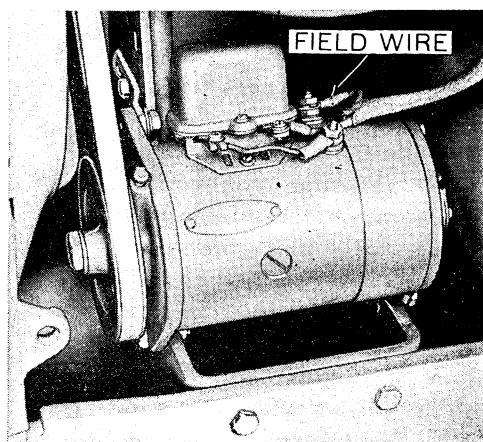


Figure 49—Generator

Battery Installation.

The battery should not be permitted to bounce around in the battery compartment as this will jar active material off the cell plates, shortening the life of the battery. Neither should the battery hold-down bracket be tightened too tight as this will buckle the battery case causing the cell plates to crack. **Caution:** When working with the battery, remember that all its exposed metal parts are "alive".

Danger Connected with Battery.

Avoid laying a tool or wire across the terminals as a spark or short circuit will result. All sparks or open flames must be kept away from the battery as the gas given off by the electrolyte is highly inflammable. If electrolyte

is spilled on clothing, damage will result if diluted ammonia or some other counteracting agent is not applied immediately to affected parts.

THE ELECTRIC GENERATOR

The generator is a means of converting mechanical energy into electrical energy. The generator used on your tractor is of the belt-driven, adjustable third brush type. The charging rate, after once set inside the generator, is controlled by a "two-step charge rate" hand control built into the light switch. See page 47 for light switch.

The purpose of the generator is to supply current for lights and keep the battery in a charged condition by replacing in the battery the energy consumed by the cranking motor in starting.

If at any time you find it necessary to operate the tractor without the battery, remove the field wire from generator terminal marked "F" on generator frame or slip off the generator belt and wire it back against the fan shaft. If generator runs without the battery, excessive voltage will build up in the generator causing damage to the generator windings.

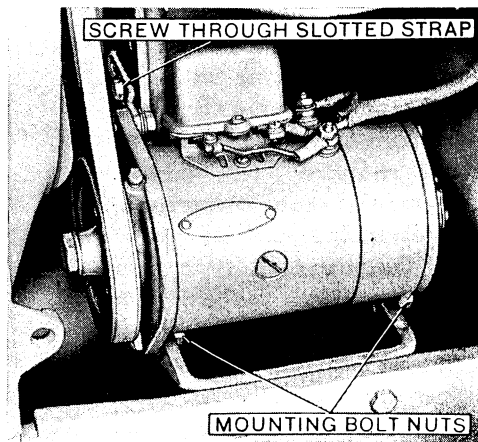


Figure 50—Generator Mounting Bolts and Strap Bolt for Generator Belt Adjustment

Adjusting Drive Belt Tension.

To adjust belt tension, rotate generator drive pulley until all slack in the belt is on bottom. Loosen the screw through slotted strap and two mounting bolt nuts. Move generator out or in until belt is adjusted with one-inch up and down movement at the center of the belt between the two pulleys. After tension is adjusted, tighten screw and nuts. To install a new generator belt, loosen generator and slip belt over fan blade and onto generator and generator drive pulleys. Adjust belt as mentioned above.

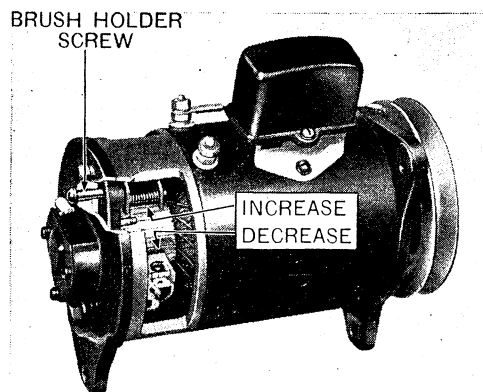


Figure 51—Generator Brush Adjustment

operate all night, the charge rate must be set so ammeter shows a 4-1/2 ampere charge. To change charging rate, remove the generator dust band and loosen the brush holder screw. Move the brush in direction armature rotates to increase, and move in opposite direction to decrease. After obtaining desired charging rate, tighten the brush holding screw. Replace the cover band, making sure it is tight and covers the openings properly.

If irregularities occur in the charging rate during the operation of the tractor, an investigation should be made immediately to determine the cause.

For generator lubrication, see page 24.

THE LIGHT SWITCH

The light and generator charging rate control switch is designed to operate in three positions. The results obtained in each of the three positions are as follows:

1. When switch is pushed all the way in, generator output is regulated for normal use and tractor should be operated with switch in this position at all times except when battery charge is noticeably low.

2. When switch is pulled out to first notch, the generator output is increased. This position is intended for use only when the battery charge is too low for satisfactory operation. **Caution:** Check and add water to battery as required before operating on high charge rate. Do not operate more than five hours at a time on this setting.

Checking and Adjusting Charge Rate.

To check the generator charging rate, first, push the light switch all the way in. Run the tractor engine at fast idle (1075 R.P.M.). If you operate your tractor without the use of the lights or use them only occasionally, the generator charging rate should be adjusted to approximately 2 ampere charge on the ammeter located on instrument panel. If during busy seasons you

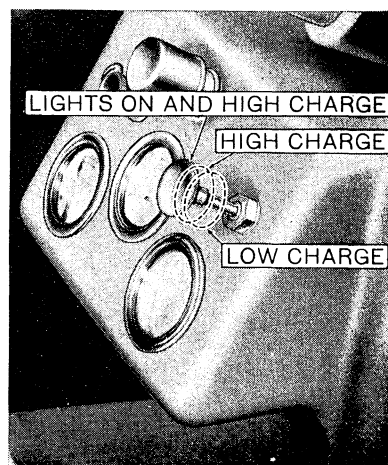


Figure 52—Positions of Light and Generator Charging Rate Control Switch

3. When switch is pulled all the way out, the lights are turned on and the higher generator output is maintained to take care of the lamp load.

Note: See that all connections to switch, generator and ammeter are tight. (Do not tighten connections when generator is running.) If generator does not charge when light switch is all the way in but does charge in any of the other switch positions, it indicates that the resistance unit is burned out and a new switch should be installed.

THE ELECTRIC STARTING MOTOR

The starting motor used on your tractor is of the heavy-duty type, built to carry a big load for a short period of time. Considerable amperage is required from the battery whenever the starting motor is used. As this drain is heavy on the battery and creates considerable heat in the starting motor, it is advisable to limit the length of time the cranking motor is used to 1/2 minute. A two minute rest period is then recommended to permit time for the electrolyte to again work on the active material of each plate, restoring the battery to a more satisfactory charge. This rest period will also allow the heat to escape from the starting motor.

If Starting Motor Fails.

If starting motor fails to function when the starting switch is operated, a complete inspection should be made as follows:

See if the battery has a high enough charge.

Check for defective cables, loose or corroded connections. Any of these conditions will result in poor starting motor performance.

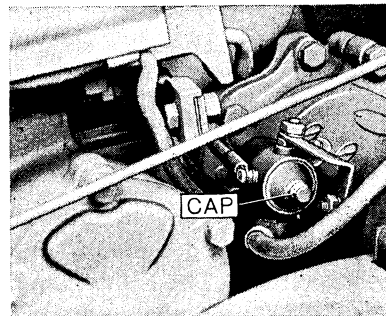


Figure 53—Starter Solenoid

To check operation of solenoid, unscrew cap as shown in Fig. 53. Should starting motor operate when button is pushed, check for defective wiring between solenoid and switch at starter button or defective switch at starter button.

Should starting motor fail to operate when button is pushed, see your John Deere dealer.

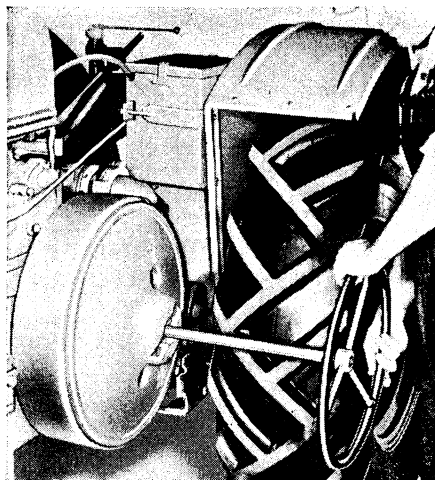


Figure 54—Hand Cranking Tractor with Steering Wheel

Do not lubricate drive member as oil collects dust and grit which will encourage sticking and cause rapid wear.

Should the battery charge be too low, the tractor can be cranked by hand. To do this, remove the tractor steering wheel, insert the stub shaft with cross pin and engage with crank ratchet on fly-wheel.

SAFETY

Tractor should not be started for a few minutes after gasoline has been accidentally spilled over the starting motor. Gasoline spilled may ignite when starting motor is operated.

THE FUSE

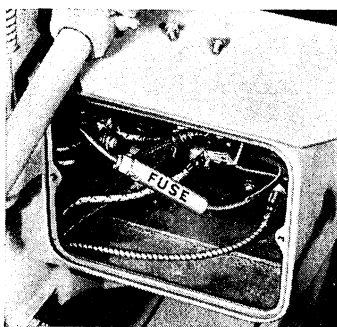


Figure 55—Fuse

The fuse is located in the lead wire which connects the light switch and ammeter. If the lights fail check the fuse. If fuse continues to burn out check wiring for short circuits or loose connections. It is important to use a 20 ampere fuse. A smaller or larger capacity fuse will not do.

A fuse is not used on tractors equipped with electric starter only (without lights) and the light switch is used to control high and low generator charge rate only.

LIGHT BULBS

Tractor lights require 6-8 volt, 32 candle power, single contact type bulbs.

SERVICE REMINDERS



Keep your tractor clean, well lubricated, and adjusted properly. Remember the old saying, "A farmer is judged by the appearance and condition of his farm machinery."

*

Use clean water in the cooling system. Don't start the engine unless the cooling system is full of water.

*

When stopping the engine, shut off the fuel control valve and then drain the carburetor.

*

Avoid over-choking in starting.

*

Be sure all air intake connections to the carburetor are tight.

*

Be sure oil gauge registers immediately after engine starts.

*

Be sure rear wheels are tight before driving tractor.

*

Avoid clashing gears in shifting. Let pulley rotate very slowly for easy shifting.

*

Fix at once leaky fuel tanks, lines, or filter bowl bodies. Eliminate fire hazards.

*

Use a feeler gauge for setting such clearances as valve tappets, spark plug gap and magneto breaker points.

*

Storage batteries should be inspected once a week. Check specific gravity, and solution level according to instructions on pages 44 and 45.

*

Avoid racing and overloading the engine during the warm-up period, especially during cold weather. Save eventual trouble and expense.

*

Make it a practice to inspect your tractor periodically for loose nuts, bolts, cap screws, and cracked castings. Overlooking the little things can often be the cause of loss of time and added expense.

Caution: Do not tighten the cap screws or remove the two covers as shown in the figure at right because the position of these two covers controls gear adjustments inside the governor.

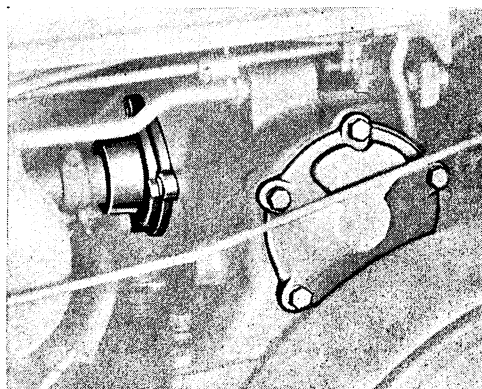


Figure 56—Governor and Fan Bearing Covers

STORING THE TRACTOR

If your tractor is to be put in storage or laid up for the winter months, these suggestions, if followed, will prevent excessive deterioration.

*

The tractor should be cleaned thoroughly and stored in a dry place.

*

Drain all oil from crankcase and oil filter, wash case with fuel. Refill with proper amount of S.A.E. 10-W oil, run engine idle for 15 to 20 minutes.

*

All water should be drained by removing the drain plug in bottom of cylinder head. Flush the cooling system to wash out any sediment which may have collected during the season's work. The water drain plug should be left out so that any water which might collect in the radiator or the water jacket by condensation will drain out.

*

All fuels should be thoroughly drained out and the drain valve left open. **Caution:** If fuel is allowed to stand in tanks, fuel lines, and carburetors, a gummy substance will form in the carburetor jets and passage and will cause plenty of trouble.

*

With the engine cold, put one-half pint of good engine oil in each cylinder through spark plug holes. Replace plugs and turn engine over several times to work the oil in between the piston and the cylinder.

*

Tractors equipped with rubber tires should be relieved of all weight by blocking up tractor. Raise tractor high enough so tires do not touch ground. Protect tires from heat and light to prevent undue deterioration. Before putting tractor back in service, tires should be properly inflated.

*

If tractor is equipped with steel wheels, it should be driven up on boards. This will prevent the lugs from being frozen in the ground. The tractor will then be available for use.

*

Protect the battery from freezing as described on page 45.

*

Inspect tractor for worn or damaged parts which may later cause expensive delays.

*

Between tractor working seasons is a good time to repair, clean, and paint the tractor. This can be done by your John Deere dealer at a nominal cost and will prove a profitable investment as paint prevents rust, corrosion, and deterioration.

SAFETY SUGGESTIONS

According to safety authorities, agriculture is one of the most hazardous of all industries. More farmers were killed by accident during the last year on record than construction workers, miners, or factory workers. Careless use of the tractor and other farm machinery causes 29 out of every 100 farm accidents. The following rules are based on a study of thousands of farm accidents and, if followed, will make your farm a safer place on which to live and work. Study these rules carefully. Follow them yourself and insist that they be followed by those working with you and for you.

*

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

*

Only one person—the operator—should be permitted on the tractor platform when tractor is in operation.

*

The rate of tractor travel on hillsides and curves should always be such that there is no danger from tipping.

*

Refuel your tractor only when the engine has been shut off. Do not smoke or use an oil lantern while refueling.

*

Refill the radiator only when the engine is idling. Be sure that there is no steam pressure back of the radiator cap to cause scalding when cap is removed.

*

Be sure power take-off shields and guards are in place and in good order before starting field work.

*

Tractor brakes should be properly adjusted.

*

Do not oil, grease, or adjust a farm machine that is in motion.

*

Clothing worn by tractor or machine operator should be fairly tight and belted. Loose jackets, skirts, shirts, or sleeves should not be permitted because of the danger of getting into moving parts.

*

All women operators should wear trousers or slacks.

*

Never drive a tractor too close to the edge of a ditch or creek.

*

Never operate your tractor in a closed garage or shed.

*

Be sure the gear shift lever of your tractor is in neutral before starting the engine.



SAFETY SUGGESTIONS—Continued

When your tractor is hitched to a heavy load, always hitch to drawbar and never take up the slack in chain with a jerk.

*

Always keep tractor in gear when going down steep grades.

*

Never ride on drawbar of tractor or drawn implement.

*

Drive at speeds slow enough to insure your safety. Reduce to low speed before turning quickly or applying individual brakes. Drive slowly over rough ground.

*

Do not ride or permit others to ride on any machine unless the person is on the seat or platform provided for the operator.

*

Do not leave the engine running unattended, even though the clutch is disengaged, while anyone is adjusting or repairing the machine to which the tractor is belted.

*

Inspect the clutch and pulley brake mechanism frequently. See that it is in good condition.

*

Never engage the clutch unless you are in a position to disengage it if necessary.

*

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

*

In hitching a drawn implement to the tractor, back the tractor past the clevis. Then move it slowly forward so that, in making the connection, the tractor will be moving away from you.

*

Provide a first-aid kit at the house for use in case of accident, and use the proper antiseptics on scratches, cuts, etc., without delay, to prevent the possibility of blood poisoning.

*

Finally, remember this: An accident is usually caused by someone's carelessness, neglect, or oversight.

TRACTOR DIFFICULTIES

1. HARD TO START. WILL NOT START.

<i>Possible Cause</i>	<i>Possible Remedy</i>
No gasoline in starting tank.	Fill with fresh gasoline.
Old gasoline in starting tank.	Drain and fill with fresh gasoline.
Distillate or tractor fuel left in carburetor.	Drain carburetor and fill with fresh gasoline.
No gasoline to carburetor.	Clean gasoline tank screen and fuel lines.
Water in fuel.	Drain fuel. Clean plugs.
No spark.	See "Ignition System". Pages 31 and 32.
Poor compression.	Leaky valves. Worn or stuck rings. Call service man.
Water in cylinder.	Leaking head gasket. Have service man check.

2. ENGINE RUNS IRREGULARLY.

Improper carburetor setting.	See "Adjusting the Carburetor". Page 30.
Improper spark plug spacing.	Space spark plugs at .030".
Irregular spark.	Dirty points. See "Magneto Distributor". Page 31.
Irregular governor action.	Have service man check.
Improper carburetor linkage.	Have service man check.
Worn throttle shaft bushing.	Have service man check and replace.
Governor to carburetor linkage binding.	Clean and relieve bind.

3. LACK OF POWER.

Throttle not wide open.	Open throttle.
Carburetor adjusted too lean.	Adjust. See "Adjusting the Carburetor". Page 30.
Unsatisfactory fuel.	Change fuels.
Engine not up to temperature.	Close shutter and operate on gasoline until engine temperature is 180°F.

3. LACK OF POWER (Continued)

<i>Possible Cause</i>	<i>Possible Remedy</i>
Air cleaner dirty or obstructed.	Clean cup and inspect filter pack. Wash out with distillate or kerosene if clogged.
Obstruction in fuel system.	See "Fuel System". Page 29.
Engine speed too low.	Have service man check and set speed.
Magneto timed too late.	See "Installing Magneto on Tractor". Page 32.
Vent in fuel tank cap obstructed.	Clean vent. Wash in distillate or kerosene and blow out with air.
Too heavy an oil in air cleaner.	Use same weight of oil as recommended for engine crankcase.
Crankcase oil too heavy.	See "Weight of Oil". Page 21.
Engine knocks excessively.	Using fuel with too low an octane. Change fuel.
Engine overheating.	See that shutter is operating correctly. Clean trash from radiator core. Flush cooling system.
Poor compression.	Leaky valves. Worn or stuck rings. Call service man to check.
Improper hitching of equipment or belting to equipment.	See instruction book accompanying equipment for proper hitching or belting.
Operating in too fast gear.	Shift to a lower speed.

4. ENGINE KNOCKS.

Magneto timed too early.	See "Installing Magneto on Tractor". Page 32.
Excessive carbon in engine.	Call service man to clean and reset valves.
Low octane fuel.	Change to fuel with higher octane.
Engine overheating.	Check water level. Clean core and remove chaff and trash.
Worn bearings, bushings, etc.	Call service man.

5. ENGINE OVERHEATS.

Temperature gauge defective.	Check water with thermometer. Have service man replace gauge if defective. (To overheat, a tractor must use water.)*
Chaff and trash in radiator core.	Clean core by flushing out chaff.

5. ENGINE OVERHEATS (Continued)

Possible Cause

Possible Remedy

Radiator shutter will not go to the wide open position.

Check adjustment. Lubricate control screw.

Radiator system limed up.

Add radiator cleaner solution to dissolve lime deposits and flush out radiator.

Use of fuel that causes knocking.

Change to a better fuel.

***A defective temperature gauge can indicate an overheated engine when actually this condition does not exist. Therefore, if the gauge consistently shows a higher than normal temperature, check water in radiator.**

6. ENGINE USES TOO MUCH OIL.

Crankcase oil too light.

See "Weight of Oil". Page 21.

Engine speed too high.

Have service man check and set.

Oil pressure too high.

Have service man check and adjust.

External leaks.

Check gaskets and plugs. Replace if necessary.

Loose connecting rod bearings.

Have service man adjust.

Piston rings worn or stuck.

Have service man replace.

Cylinders worn.

See your dealer for rebored or new block assembly.

7. ENGINE DILUTES OIL.

Using too heavy a fuel.

Change fuel.

Running engine too cold.

Maintain 190°F. engine temperature.

Idling engine for long periods.

Shut engine off or idle on gasoline.

Using too light a crankcase oil.

See "Weight of Oil". Page 21.

Worn engine piston rings or cylinders.

Have service man check.

Oil pressure too low.

Have service man check and adjust.

8. ENGINE OIL PRESSURE TOO HIGH OR TOO LOW.

Defective gauge.

Have service man check with master gauge.

Loose or broken oil line.

Have service man check and repair at once.

Improper weight of oil.

See "Weight of Oil". Page 21.

Pressure regulating valve stuck.

Have service man check.

Bearings worn and loose.

Have service man adjust.

9. ENGINE USES TOO MUCH FUEL.

<i>Possible Cause</i>	<i>Possible Remedy</i>
Improper carburetor adjustment.	See "Adjusting the Carburetor" Page 30.
Float level too high.	Have service man adjust.
Engine not operated up to proper temperature.	Maintain 190° F. engine temperature.
Engine overloaded.	Lighten load or shift to a slower speed.
Improper hitch of drawn implement.	See implement instruction book for proper hitch.
Engine speed too fast.	Have service man check and reset.
Poor compression.	Have service man check valves and rings.

10. SPARK PLUG FOULING.

Low engine temperature.	Keep engine above 190° F.
Too heavy a fuel.	Change to more suitable fuel.
Mixed fuel.	Keep engine above 190° F.
Wrong heat range plug.	See "Spark Plugs". Page 31.
Piston rings worn.	Have service man replace rings.

11. BRAKES NOT EFFECTIVE.

Improperly adjusted.	See "Brakes". Page 36.
Over-lubricated.	Have service man remove and clean out.
Brake lining worn.	Have service man replace.
Brake squeak.	Have service man clean.
Brake pedal sticking.	Clean brake shaft with distillate and lubricate.

12. PULLEY BRAKES NOT EFFECTIVE.

Out of adjustment.	See "Pulley Brake." Page 37.
Lining worn.	Have service man replace.

NOTES

[illegible]

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

INDEX

	<i>Page</i>
Air Cleaner.....	23
Battery.....	44-45
Before Starting Engine.....	14
Belt Work.....	18
Brake, Pulley.....	37
Brakes.....	10, 36
Carburetor.....	30
Choke.....	9
Clutch.....	11, 35-36
Cold Weather Operation.....	34
Cooling System.....	33-34
Crankcase Breather Core.....	23
" Flushing.....	25
" Oil Level.....	22
" Weight of Oil.....	21
Drawbar.....	42-43
Electric Generator.....	46-47
" Starter.....	48
Engine Cranking.....	10
" Lubrication.....	20
" Temperature.....	9, 16
Front Wheels.....	38
Fuels.....	13
Fuel Control.....	9
" System.....	29
Fuse Location.....	49
Gear Shift.....	12
Generator.....	46-47
Grease Fittings.....	24
Heat Indicator.....	9
Ignition System.....	31-33
Light Bulbs.....	49
" Switch.....	47
Lubrication Service, Periodic.....	22-28
" " 10-Hour.....	22
" " 60-Hour.....	24
" " 120-Hour.....	25
" " 500-Hour.....	26
" " Yearly.....	27
Magneto.....	31-33

INDEX—Continued

	<i>Page</i>
Oil Change, Engine	25
“ “ Transmission	27
Oil Gauge	9
“ Filter	25
Oil Level, Crankcase	22
“ “ Transmission	27
Oil Weight Chart, Engine	21
“ “ “ Transmission	22
Operating the Tractor	16
Periodic Lubrication Service	22–28
Power Shaft	12
Pulley Brake	37
Purpose of Lubrication	20
Radiator	14, 34
Brakes	10–11, 36–37
Rear Wheel Weights	40
Replacing Oil Filter	25
Rubber Tires	39–41
Run-In Period	14
Seat	8
Service Reminders	50
Shutter, Radiator	9
Spark Plugs	31
Specifications	4–5
Starting Engine	15
Steering	8
Stopping Engine	19
“ Tractor	19
Storing Fuel	13
“ Lubricants	20
“ Tractor	51
Tappet Adjustment	36
Tire Inflation	39
Transmission Lubrication	22, 27
Valve Adjustment	36
Weights, Rear Wheel	40
Yearly Service	27

NOTES

[illegible]

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

IMPORTANT

Make this manual your guide and adviser and do what it recommends, regardless of what may have been your practice with other makes of tractors, or the suggestions that may be made to you by well-meaning friends or neighbors.

When using this tractor with mounted or integral equipment, special servicing of the tractor may be required. This information will be given to you in the instruction book accompanying the integral or mounted equipment.



nobody can fill them like you can!

That's what the owner of this pair of work shoes is finding out—the hard way. Through a careless action, he has become the victim of an accident. It's a mighty tough way to find out that nobody else can wear your shoes or practice safety for you. And a needless, costly lesson to learn that safety is an everyday need.

Put safety into each of your workdays; read the operator's manual thoroughly; know how to operate each machine properly and safely; take the safety precautions specified; think before you act.

Make sure you wear your "shoes" everyday. Outfit yourself with a safety program now.

