Model 50 Series Tractors

JOHN DEERE

SERVICE MANUAL

Model 50 Series
Tractors

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SERVICE MANUAL FOR JOHN DEERE DEALERS

MODEL 50 SERIES TRACTOR

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INTRODUCTION

This Unit of the Service Manual contains maintenance instructions for the Model "50" Tractor. Included are complete instructions for removal, disassembly, inspection, repair, assembly, and installation of all parts and assemblies.

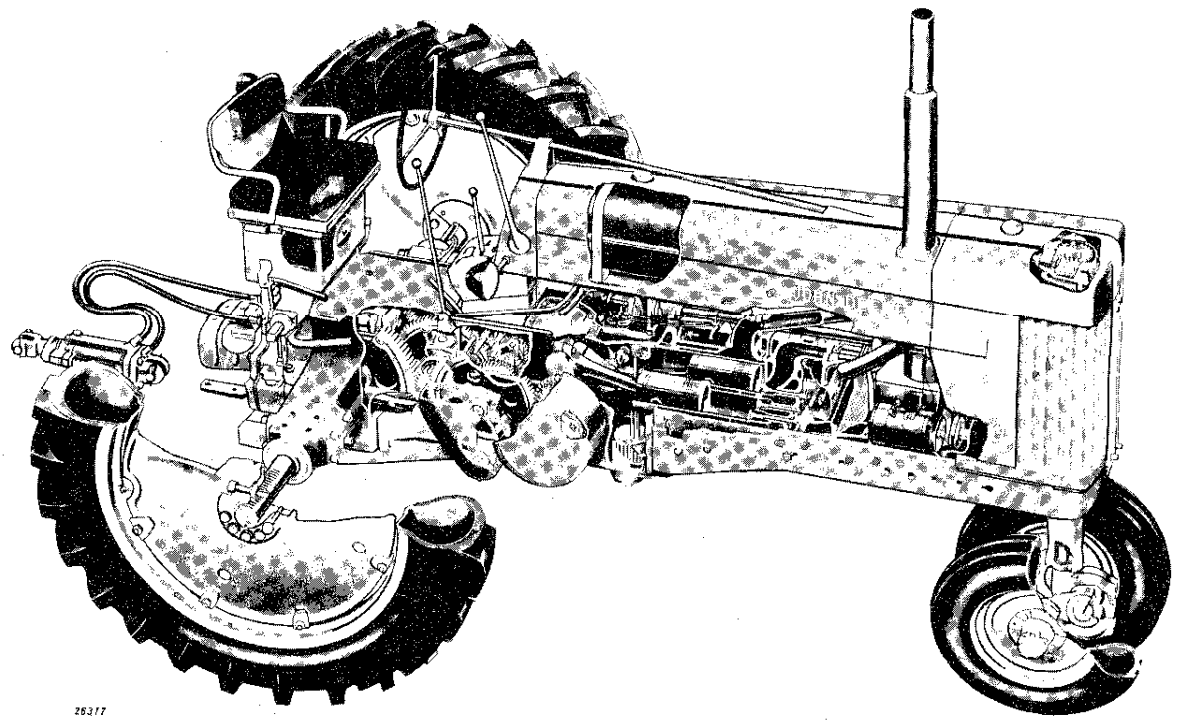
In addition, the manual contains a brief description of the more complicated systems of the tractor and tells how they operate. Dimensions of many new wearing parts are given as an aid in determining when parts replacement is necessary. Tests and adjustments required to keep the tractor operating at full efficiency are explained in detail. Full instructions on preparing a new tractor for delivery to the customer are included.

Complete instructions for testing, repairing, and adjusting the carburetor, generator, starter, and distributor are given in the *"Tractors and Engines (General)"* Unit of the Service Manual. For additional information concerning Powr-Trol mechanism, consult "Hydraulic Equipment, Tractors (Waterloo)" Unit of the Service Manual.

If tractor design changes or improved methods of maintenance are found, new pages with the latest information will be supplied for your Service Manual. When these pages are sent to you, insert them in your manual immediately. Keep your book up-to-date at all times and you will profit by the suggestions given.

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

Daily use of the Service Manual as a guide for any and all service problems will reduce error and costly delay to the minimum and assure you the best in finished service work.



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Cut-Away View of John Deere Model "50" Tractor

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Section 10
Description and Specifications

Group 5
DESCRIPTION

The John Deere Model "50" Tractor is a general purpose tractor with sufficient power to pull two 14-inch plow bottoms or the equivalent under normal conditions. The tractor has six forward speeds and one reverse speed.

The features of the tractor are described briefly in the paragraphs which follow. Full descriptions of each of the components or assemblies are contained in the various Sections throughout this manual.

Serial Numbers.

Each tractor bears a serial number located on top of the main case just under the distributor (Figure 10-5-1).

The distributor and the Powr-Trol valve housng also bear serial numbers.

Engine.

The tractor is powered by a two-cylinder, cast-in-block, valve-in-head engine with a displacement of 190.4 cubic inches. Rotation is counterclockwise when viewed from the fly-wheel side.

The engine has aluminum alloy, sleeve-type main bearings and replaceable, precision-type connecting rod bearings. All bearings and other parts of the engine are pressure lubricated by a full force feed pressure system with a full flow oil filter. The system includes a replaceable Purolator filter element. The crankcase is ventilated by a pump located on the rear end of the fan shaft. Engine speeds are controlled by a fly-ball type governor driven by the camshaft.

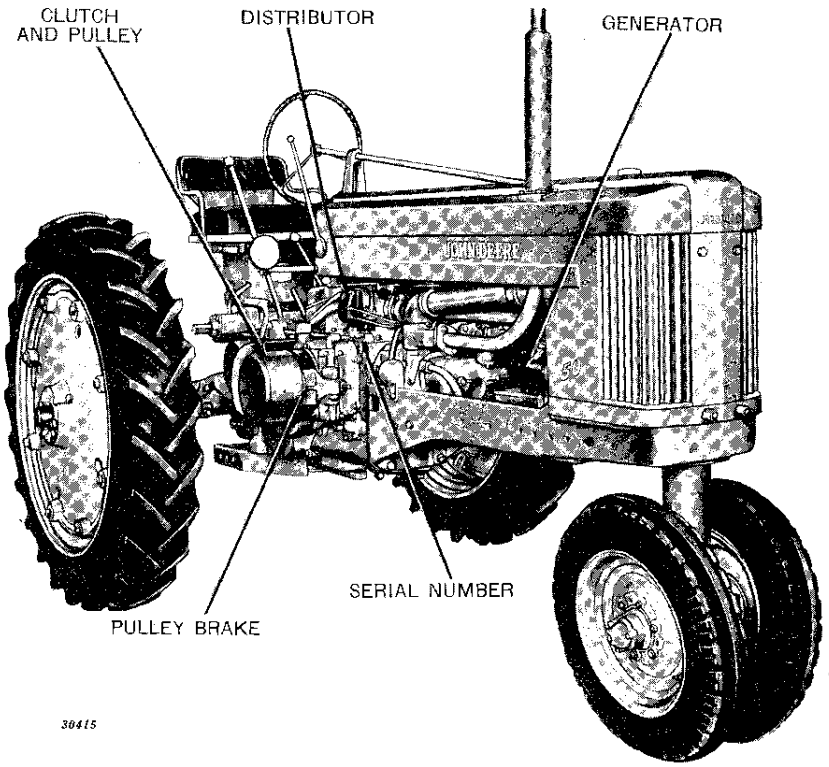


Figure 10-5-1—John Deere Model "50" Tractor—Pulley Side

Fuel System.

Both gasoline and All-Fuel tractors are available.

These tractors are equipped with a dual-induction carbureting system using a gravity-fed, natural-draft, dual intake carburetor and individually ported valves. Some early All-Fuel tractors used a natural-draft, single intake carburetor. The All-Fuel tractor has two fuel tanks—a large tank for fuel and a small auxiliary tank for gasoline which is used when starting the All-Fuel engine.

An oil-wash air cleaner assures clean air for the engine.

Ignition.

The tractor has a battery-distributor type ignition system with automatic spark advance. A 12-volt battery, generator, starter and lights are standard equipment. The lights consist of two front lights which can be made bright or dim, and a rear combination white and red warning light.

Cooling System.

The engine is water cooled. The cooling system includes a centrifugal-type water pump and a thermostatically controlled shutter.

Clutch.

A dry disk, hand-operated clutch is enclosed within the belt pulley. The clutch contains four 7-inch dry disks. It is engaged by the clutch lever and rotates at crankshaft speed. When the clutch is disengaged, an adjustable pulley brake prevents pulley rotation.

Transmission and Differential.

The transmission lies crosswise in the main case. Shifting through the entire range of six forward speeds and one reverse speed is accomplished by one shift lever.

The differential is of the conventional type with a ring gear and spider driven directly by a pinion in the transmission.

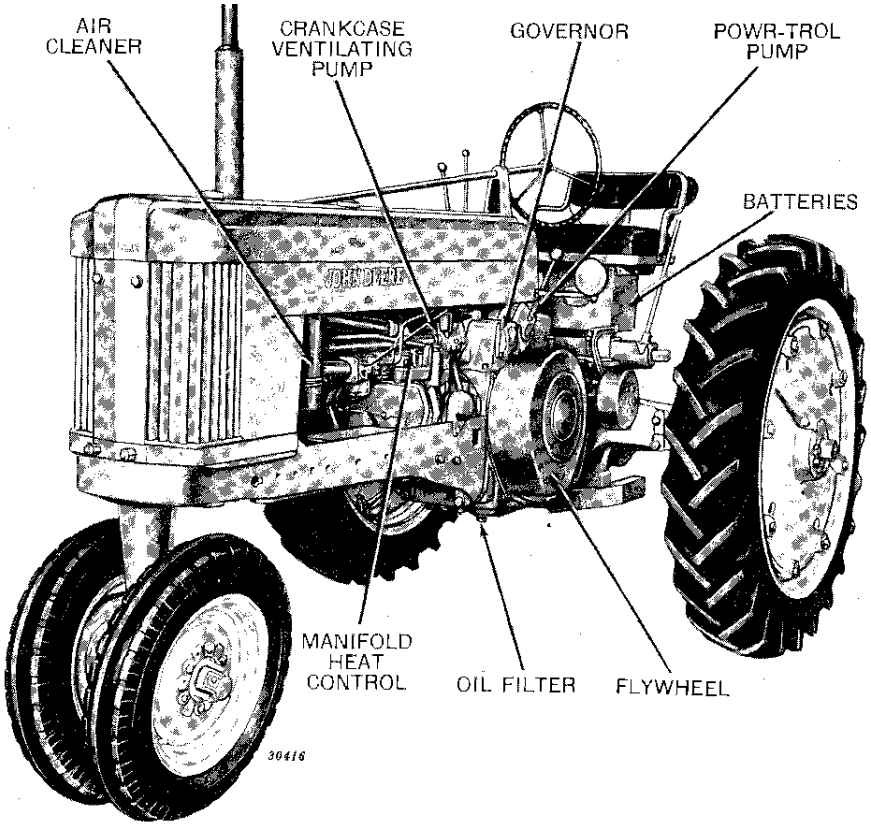


Figure 10-5-2—John Deere Model "50" Tractor—Flywheel Side

Brakes.

Two individually operated foot brakes are provided to stop the tractor or hold it on inclines. Each brake has two internal-expanding brake shoes and a drum with a shaft and gear which meshes with the final drive gear.

Front Wheel Assemblies.

The tractor may be equipped with a variety of front wheel assemblies. These include the Roll-O-Matic, standard dual front wheel, wide adjustable front axle, single front wheel, and 38-inch fixed tread. The wide adjustable front axle provides a tread range from 56 to 80 inches in 4-inch steps.

Rear Wheels.

Rear wheel tread adjustment is made by a pinion located in the wheel hub which engages a rack on the axle. Extreme adjustments are made by changing the position of the rim and tire on the wheel.

The tractor may be equipped with *regular-length* rear axles or *long* rear axles. With regular axles and 38-inch tires the tread range is 56 to 88 inches. With long axles and 38-inch tires the tread range is 62-1/2 to 97-3/4 inches. If the tractor has long axles and 42-inch tires the tread can be adjusted from 56 to 104 inches.

Power-Take-Off Shaft.

Two types of power take-off shaft are available: the conventional transmission-driven type, and optional, engine-driven "live" type with self-contained clutch permitting operation of P.T.O. equipment independently of tractor ground travel. Both types of shaft conform to A.S.A.E. standards.

Hydraulic System.

The tractor may be equipped with Powr-Trol which raises, lowers, or sets integral implements at any desired depths. An implement-mounted remote cylinder may be used with Powr-Trol. The gear type hydraulic pump is mounted on the rear of the governor case and is driven through an idler gear by the camshaft.

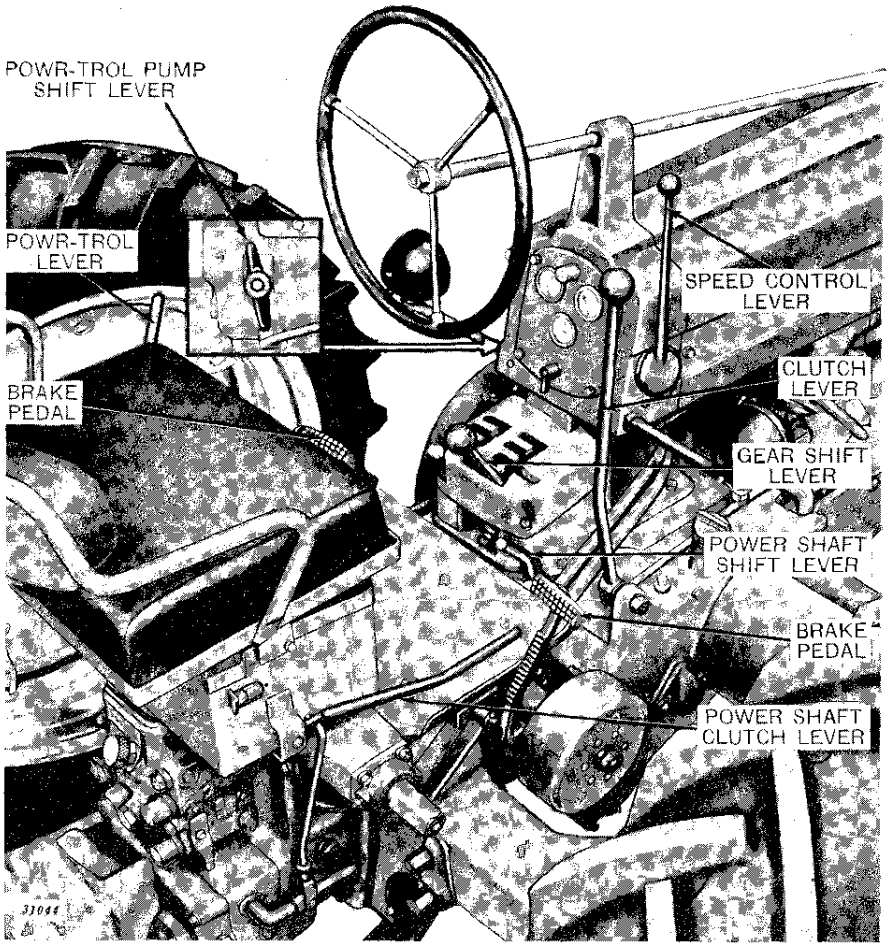


Figure 10-5-3—Operating Controls

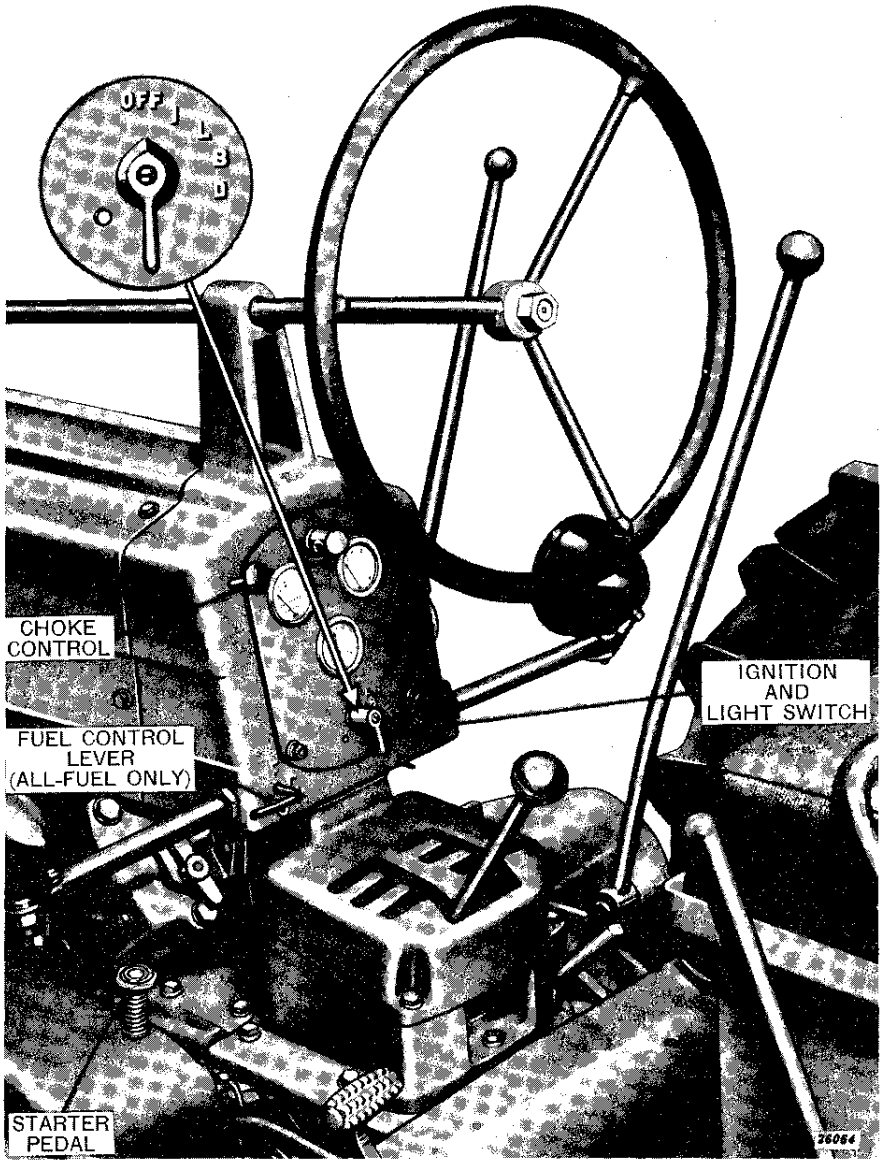


Figure 10-5-4—Starting Controls

Group 10
SPECIFICATIONS

PERFORMANCE:

Capacity for Work:

Two 14-inch plow bottoms or a two-bottom bedder under normal conditions.

Maximum Belt Horsepower:

*Gasoline	30.97
**All-Fuel	00.00

Maximum Drawbar Horsepower:

*Gasoline	27.49
**All Fuel	00.00

CAPACITIES (U. S. MEASUREMENTS):

Gasoline Tank:	
Gasoline Tractor	15-1/2 Gals.
All-Fuel Tractor	2 Gals.
Fuel Tank (All-Fuel)	15-1/2 Gals.
Crankcase	7 Qts.
Transmission	4-1/2 Gals.
Powr-Trol	6 Qts.
Power Shaft Clutch	1-3/4 Qts.
Remote Cylinder	1 Qt.
Cooling System	7 Gals.

SPEEDS:

Gear	10-38 Tires	9-42 Tires
1	1-1/2 mph	1-3/4 mph
2	2-1/2 mph	2-3/4 mph
3	3-1/2 mph	3-3/4 mph
4	4-1/2 mph	4-3/4 mph
5	5-3/4 mph	6 mph
6	10 mph	10-3/4 mph
Reverse	2-1/2 mph	2-3/4 mph

ENGINE:

Type	Two-cylinder, cast-in-block, valves-in-head.
Engine Speeds:	
Load	1250 rpm
Idle	1375 rpm
Bore and Stroke	4-11/16" x 5-1/2"
Displacement	190.4 cubic inches
Compression-Ratio:	
Gasoline	6.1 to 1
All-Fuel	4.65 to 1

**Sea level (calculated): Maximum h.p. based on 60° F. and 29.92 in. hg. (Nebraska Test No. 486).*
***All-Fuel Tractor not tested at Nebraska.*

LUBRICATION SYSTEM:

Type	Full force-feed pressure system with purolator oil filter element.

FUEL SYSTEM:

Type	Gravity feed.
Carburetor	Natural-draft duplex type
Early All-Fuel	Natural-draft type
Air Cleaner	Oil-wash type

COOLING SYSTEM:

Type	Centrifugal pump and thermostatically controlled shutter.

IGNITION SYSTEM:

Type	Battery-Distributor
Distributor Point Gap	.015"
Spark Plugs:	
Size	18 mm.
Spark Plug Gap	.030"

ELECTRICAL SYSTEM:

Battery Voltage	12 Volts
Generator Regulation	Current Voltage Regulator.
Battery	Group 1

CLUTCH:

Type	Hand-operated, four 7-inch dry disks.

BELT PULLEY:

Diameter	9-11/16"
Width	7-1/4"
Rpm (Load)	1250
Belt Speed	3170 fpm

TRANSMISSION:

Type	Six speeds forward and one in reverse.
Gears	Selective-type, straight spur-cut gears, forged and heat-treated.
Bearings	Shafts operate on three roller bearings, four tapered roller bearings, and five ball bearings.

(Continued on next page)

REAR AXLES:

Diameter	Regular.... 2-7/8″ Long..... 3-1/8″
Bearings	Four tapered roller bearings.
Types Available	Regular and long

REAR WHEELS AND TIRES:

Regular Rear Axle	10-38, 4-ply tires on cast disk wheels (recommended for average field conditions). 11-38, 4- or 6-ply tires also available.
Long Rear Axle	9-42, 6-ply tires on cast disk wheels. 11-42, 6-ply, 10-38, 4-ply and 11-38, 4- or 6-ply tires also available.

REAR WHEEL BRAKES:

Type	Two automotive-type internal-expanding rear wheel brakes.

FRONT WHEELS AND TIRES:

Double and Adjustable Type:
Reversible for added clearance.

Bearings	Four tapered roller bearings.
Tires	5.50 x 16″, 4-ply.

Single Type:

Bearings	Two tapered roller bearings.
Tires	6.50 x 16″, 4- or 6-ply. 9.00 x 10″, 8-ply.

	Double Front Wheel*	Single Front Wheel (42″ Rear Wheel)	Adjustable Tread Front Axle (42″ Rear Wheel)
POWER TAKE-OFF:			
Shaft Diameter	1-3/8″	1-3/8″	1-3/8″
Shaft rpm:			
Transmission Driven	541	541	541
Direct Engine Driven	532	532	532
Splined End Ahead of Hitch	14″	14″	14″
Splined Shaft Above Ground:			
Transmission Driven	21-1/16″	22-3/4″	22-3/4″
Direct Engine Driven	22-5/8″	24-5/16″	24-5/16″
DIMENSIONS:			
Wheel-Base	90″	90-1/4″	96-3/8″
Over-All Height	82-3/16″	82-3/4″	83-3/4″
Height to Radiator Cap	59-7/8″	60-7/16″	61-7/16″
Width Over Axles	86-5/8″	95-15/16″	95-15/16″
Tread Adjustments	56-88″**	56-104″	56-104″
Clearance	24-1/4″	26″	Front 24″ Rear 26″
Turning Radius	8′ 7-1/2″	10′ 5″	17′ 0″
SHIPPING WEIGHT	4435 lbs.	4465 lbs.	4875 lbs.

(Weights are for Tractor dry and with wheel equipment as shown under "*Front Wheels*" and "*Rear Wheels*")

**Available with 2-piece pedestal—double front wheel—single front wheel or adjustable tread front axle.*

***Available with long axles providing tread of 62-1/2″ to 97-3/4″.*

Section 20
PREPARING THE TRACTOR FOR DELIVERY TO THE CUSTOMER
(Off the Car or Truck)

Group 5

Each Model "50" Tractor is manufactured with care and precision. Before it leaves the factory it is thoroughly inspected, adjusted, and tested.

However, during shipment and storage, many situations exist which may affect the general condition of the tractor. It is therefore important that the tractor be inspected thoroughly, and adjusted if necessary, before it is delivered to the customer.

By following the procedures given in this *Section*, you can be certain that the tractor is delivered in tip-top condition—ready to perform the work for which it was built. You will save time and money by avoiding after-delivery complaints and service calls which will result if the tractor is not correctly adjusted when it leaves your shop. Above all, you can be sure of a satisfied customer when he puts the tractor to work.

Instructions pertaining to the preparation of tractors for temporary or permanent storage, and steps required to remove tractors from storage can be found under *"Tractor Storage"* in the *"Tractors and Engines (General)" Unit* of the Service Manual.

The chart below is a quick reminder of all points which should be checked or inspected prior to delivery. Detailed instructions for the less experienced serviceman follow the chart.

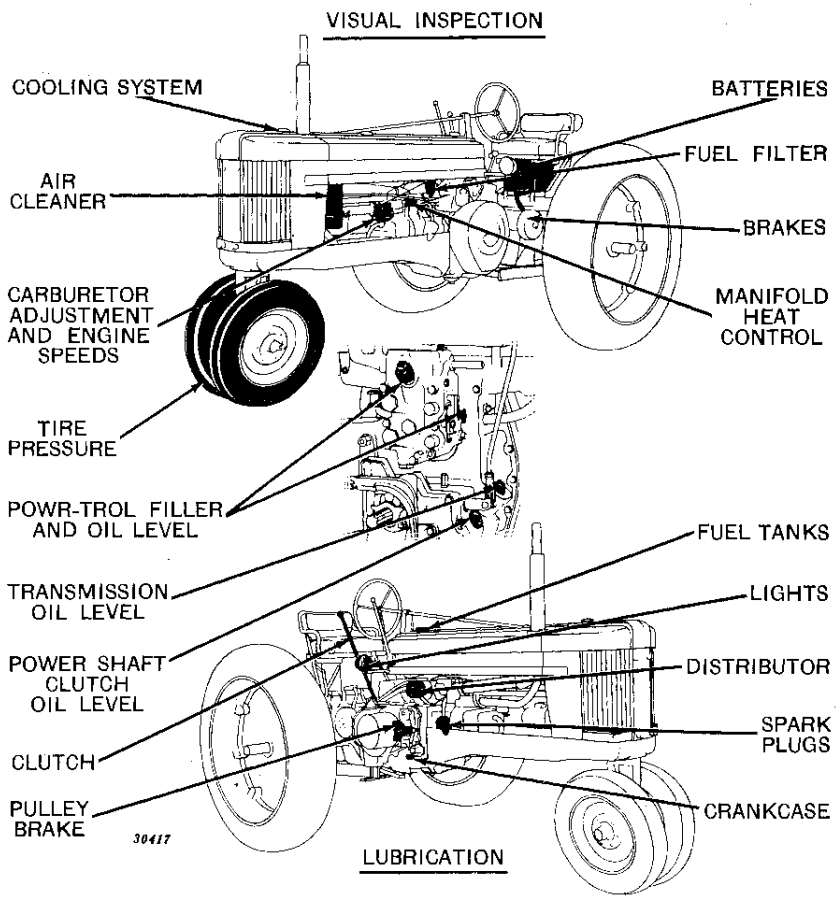


Figure 20-5-1—Pre-Delivery Check Points

VISUAL INSPECTION.

When the tractor is received, inspect it carefully, tightening all bolts, nuts, and cap screws. Note any dents, scratches, or other damage which may have occurred in transit. Repair or replace all damaged parts before the tractor is delivered.

COOLING SYSTEM.

Be sure that drain plug is installed in bottom of cylinder head and fill radiator with clean soft water or anti-freeze solution. Capacity of the cooling system is 7 U. S. gallons.

TIRES.

When tractors are shipped from the factory the tires are overinflated to prevent possible damage to the tractors while in transit. Check the pressure in the tires and deflate them to the correct operating pressure as shown in the chart below.

RUBBER TIRE INFLATION CHART

Rear Tires

Tire Size	*Ply*	**Inflation Pressure Without Added Wheel Weight*	*Maximum Permissible Additional Weight per Wheel at Maximum Recommended Inflation Pressure*
10-38	4	12 lbs.	350 at 16 lbs.
11-38	4	12 lbs.	350 at 12 lbs.
11-38	6	12 lbs.	350 at 12 lbs.
11-38	6 (C&R)	12 lbs.	350 at 12 lbs.
9-42	6	18 lbs.	350 at 20 lbs.
11-42	6	12 lbs.	350 at 12 lbs.

Front Tires

5.50 x 16, 4-Ply—32 lbs.
6.50 x 16, 6-Ply—36 lbs.
6.50 x 16, 8-Ply—36 lbs.
9.00 x 10, 8-Ply—44 lbs.

**If the tractor is to be used for plowing advise the operator to increase the pressure in the furrow rear tire 4 pounds.*

BATTERIES.

Remove the seat, connect the battery terminal, and check the specific gravity of the electrolyte. It should be checked with an accurate hydrometer before adding water (Figure 20-5-2).

If liquid level is too low to check, add distilled water and run the engine for a few minutes permitting the water and electrolyte to mix; then check. Specific gravity should not go below 1.225 which is half charge. When fully charged the reading will be 1.240 to 1.255. Grease the terminal posts to reduce corrosion.

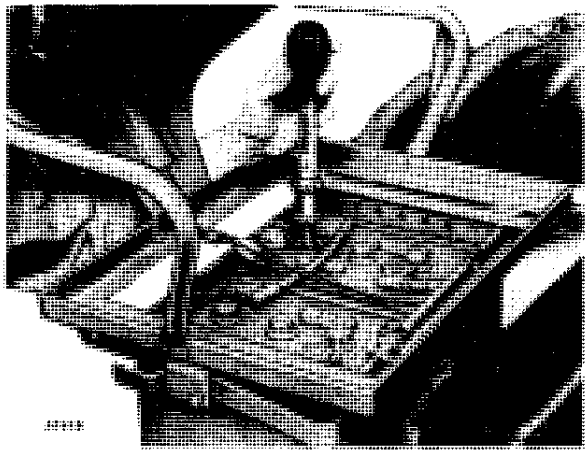


Figure 20-5-2—Checking Specific Gravity of Battery with a Hydrometer

AIR CLEANER.

Remove the air cleaner cup (Figure 20-5-3) and note oil level. If it is low, add clean SAE 10-W oil until the level is even with the oil level mark on the cup.

Figure 20-5-3—Air Cleaner

CRANKCASE OIL LEVEL.

Check the crankcase oil level by opening the test cock (Figure 20-5-4). If oil does not run out, add a good grade of SAE 10-W oil.

Figure 20-5-4—Crankcase Oil Level Test Cock

TRANSMISSION OIL LEVEL.

The transmission should be full of oil up to the filler plug (Figure 20-5-5). If necessary, add a good grade of SAE 90 transmission oil until its level is satisfactory. (Use SAE 80 oil if prevailing temperatures are below 0° F.)

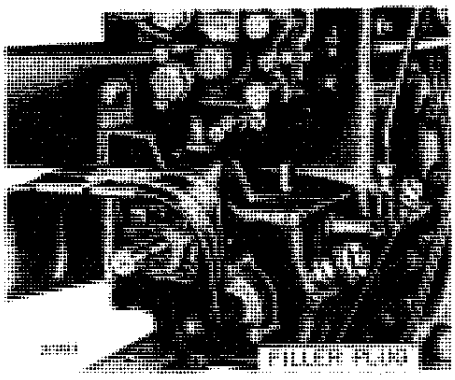


Figure 20-5-5—Transmission Filler Plug

POWR-TROL OIL LEVEL.

If the tractor is equipped with Powr-Trol, open the oil level cock (Figure 20-5-6) and see if oil runs out. If it does not, add good clean SAE 10-W oil.

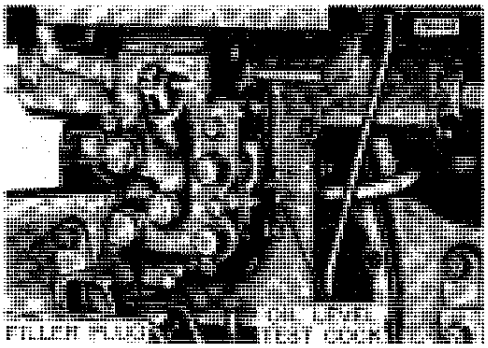


Figure 20-5-6—Powr-Trol Oil Level Test Cock and Filler Plug

POWER SHAFT CLUTCH OIL LEVEL.

If the tractor is equipped with an engine-driven "live" power shaft, check the oil level in the clutch by removing the filler plug (Figure 20-5-7). If oil does not run out, add good clean SAE 10-W oil until it does.

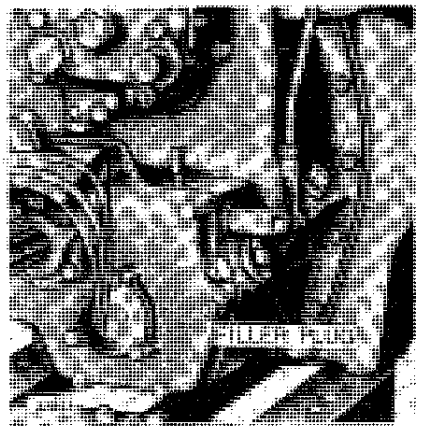


Figure 20-5-7—Power Shaft Clutch Filler Plug

MANIFOLD HEAT CONTROL.

When preparing a tractor equipped with a dual intake carburetor for delivery, check position of the manifold heat control valve (Figure 20-5-8). If the prevailing temperature is above 32° F. turn the valve to the "COLD" position by loosening the clamp which holds it in place. If the prevailing temperature is below 32° F. turn the valve to the "HOT" position. *Be sure "V" marks on valve and side of manifold line up before tightening clamp. Since the manifold heat control valve is a two-position valve only, do not set it in any intermediate position; otherwise damage to the engine may result. Never attempt to change the control with the engine running.* Advise the operator to set the valve in the "COLD" position regardless of temperature if the tractor is to be used continuously under full load.

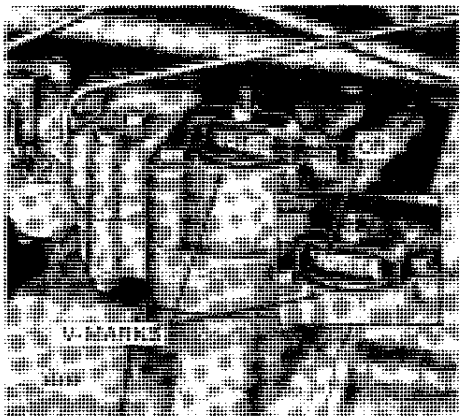


Figure 20-5-8—Manifold Heat Control Valve

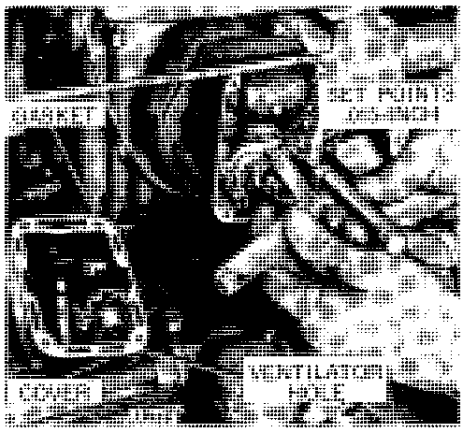
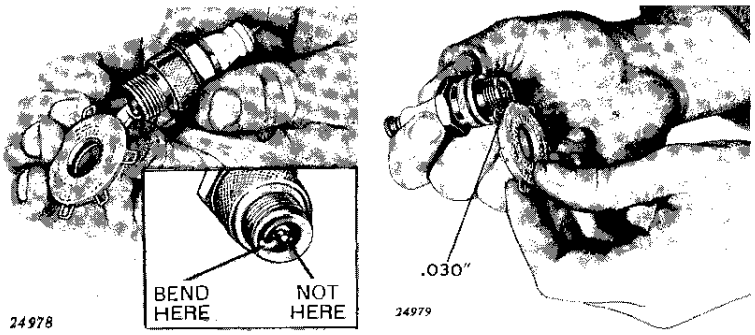


Figure 20-5-9—Adjusting Distributor Point Gap

Reinstall all distributor parts. Upper cap terminal wire goes to spark plug on flywheel side of tractor.

SPARK PLUGS.

Remove each spark plug and check the gap for .030-inch between electrodes. Adjust the gap if it is not set properly (Figure 20-5-10).



Setting Point Gap *Checking Point Gap*

Figure 20-5-10—Adjusting Spark Plug Gap

DISTRIBUTOR.

Remove distributor cap, arm, and cover (Figure 20-5-9). Turn flywheel until cam opens points to widest position. Using a feeler gauge measure point gap and adjust to .015-inch if gap is not correct.

FUEL TANKS.

Use only good clean fuel in the tractor. Capacity of the main tank for both gasoline and All-Fuel tractors is 15-1/2 U.S. gallons. Capacity of the auxiliary tank on All-Fuel tractors is 2 U.S. gallons.

FUEL FILTER.

If glass filter bowl beneath the gasoline tank shows water or sediment, turn off the gasoline supply, remove and clean the glass bowl and screen. Use a good gasket when replacing the filter bowl.

ENGINE SPEEDS.

After completing the tests and services listed above, start the engine and permit it to reach operating temperature.

As soon as the engine is started look at the oil pressure gauge to make sure the engine lubrication system is working properly. If the gauge does not register pressure turn the engine off immediately and determine the cause.

Check slow and fast idle speeds and the load speed using a revolution counter on the right end of the crankshaft. Both gasoline and All-Fuel engines operate at the same speeds as follows:

Slow Idle— 600 rpm
Fast Idle—1375 rpm
Load —1250 rpm

If any of the above speeds is incorrect, make adjustments according to instructions in *Section 40* of this manual.

CARBURETOR ADJUSTMENTS.

With engine running, note the idling characteristics. If the engine does not idle smoothly, adjust the carburetor load and idle needles as explained in *Section 40* of this manual.

CLUTCH OPERATION.

The clutch should go into engagement with a snap requiring 40 to 80 pounds pressure on the end of the lever. If adjustment is incorrect, remove the pulley cover, engage the clutch, and tighten the three slotted nuts (Figure 20-5-11) a little at a time to maintain equal tension until adjustment is correct. Make a final check of clutch operation while the engine is running.

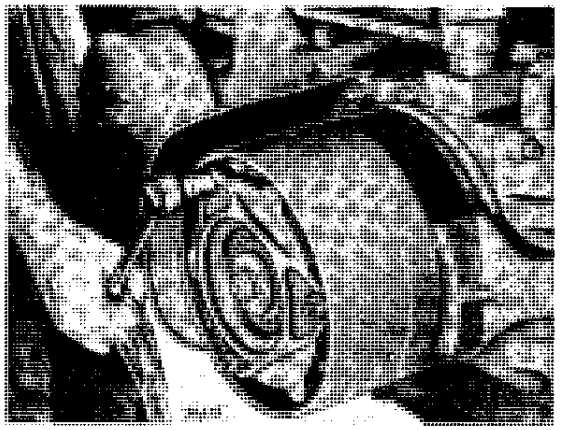


Figure 20-5-11—Adjusting the Clutch

PULLEY BRAKE.

With the engine running, test the pulley brake to see that it is adjusted properly. This adjustment is important because the pulley brake not only stops the pulley from turning when the clutch is disengaged, but it also insures positive disengagement of the clutch when the clutch is released. The pulley brake should be adjusted so that when the clutch lever is moved slightly forward from the rear, the pulley is free to turn. To make the adjustment, engage the clutch, hold the pulley brake tightly against the pulley, and turn the adjusting screw (Figure 20-5-12) until there is approximately 1/16-inch clearance between the end of the screw and the operating pin in the clutch fork bearing.

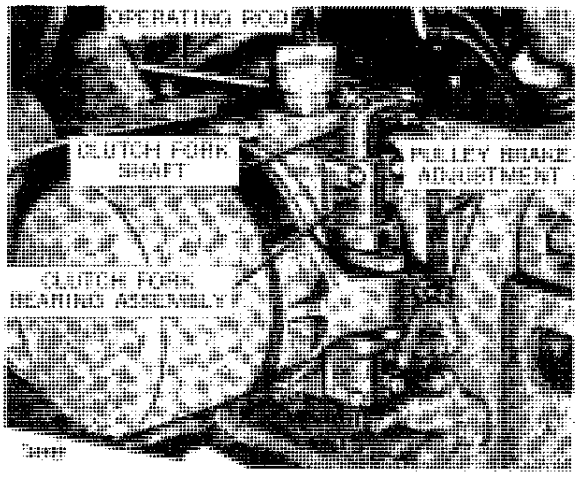


Figure 20-5-12—Pulley Brake Adjusting Screw

REAR WHEEL BRAKES.

Test the brakes to be sure they work properly. Each brake pedal should have 1-1/2- to 2-inch free movement before the shoe contacts the drum. If necessary, adjust the brakes by tightening the adjusting screw and backing it off 5 notches (Figure 20-5-13).

Figure 20-5-13—Adjusting Rear Wheel Brake

WHEEL WEIGHTS.

If the customer has specified cast-iron wheel weights or calcium chloride in the tires, be careful to install them properly. See *Section 160* for suggestions regarding the use of a tire gauge and the installation of weights. The last column in the chart on page 20-5-2 shows the maximum amount of weight that can be added to the wheels. If weights are added, recheck the tire pressure.

LIGHTS.

Turn on the combination ignition-light switch (Figure 20-5-14) to see that the lights are working properly. The five positions provide the following:

"OFF"—Both ignition and lights off
"I" —Ignition only
"L" —Bright front lights and white rear light
"B" —Bright front lights and red rear light
"D" —Dim front lights and red rear light

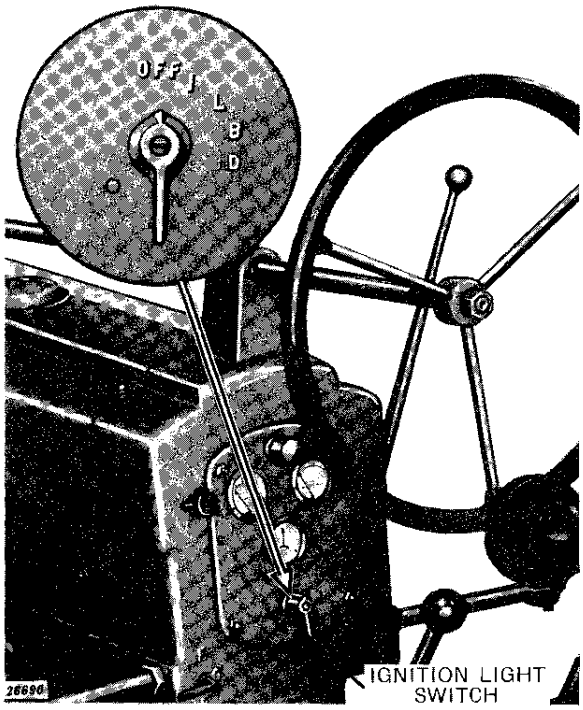


Figure 20-5-14—Combination Ignition-Light Switch

LUBRICATION.

Lubricate the entire tractor using the chart in Figure 20-5-16 on the next page as a guide to the location of grease fittings.

When all inspections and services in the above paragraphs are completed, the tractor will leave your shop in the best of condition, ready to perform dependably and economically.

DISCUSSING THE TRACTOR WITH ITS NEW OWNER.

Before releasing the tractor to its new owner, discuss with him the valuable information contained in the Operator's Manual. A list of the most important items and operations with which the owner should be familiar will be found on page 3 of the Operator's Manual.

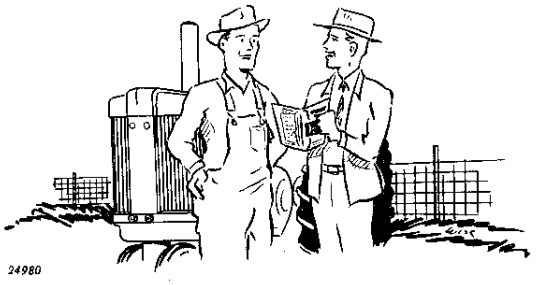


Figure 20-5-15—Discussing the Operator's Manual with the New Owner