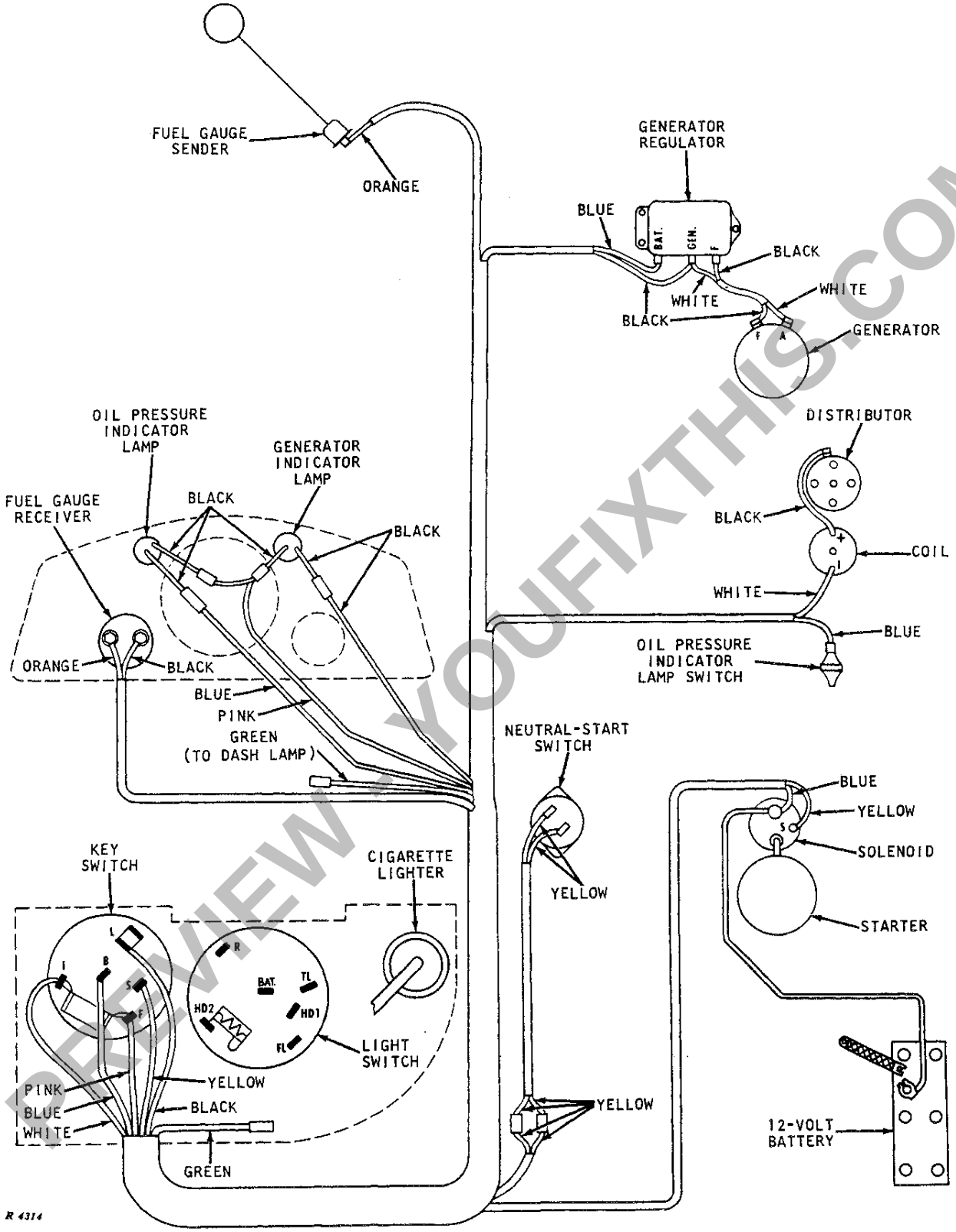


Fig. 200-45-2—Gasoline Tractor Instrument, Ignition, and Starting Wiring Diagram

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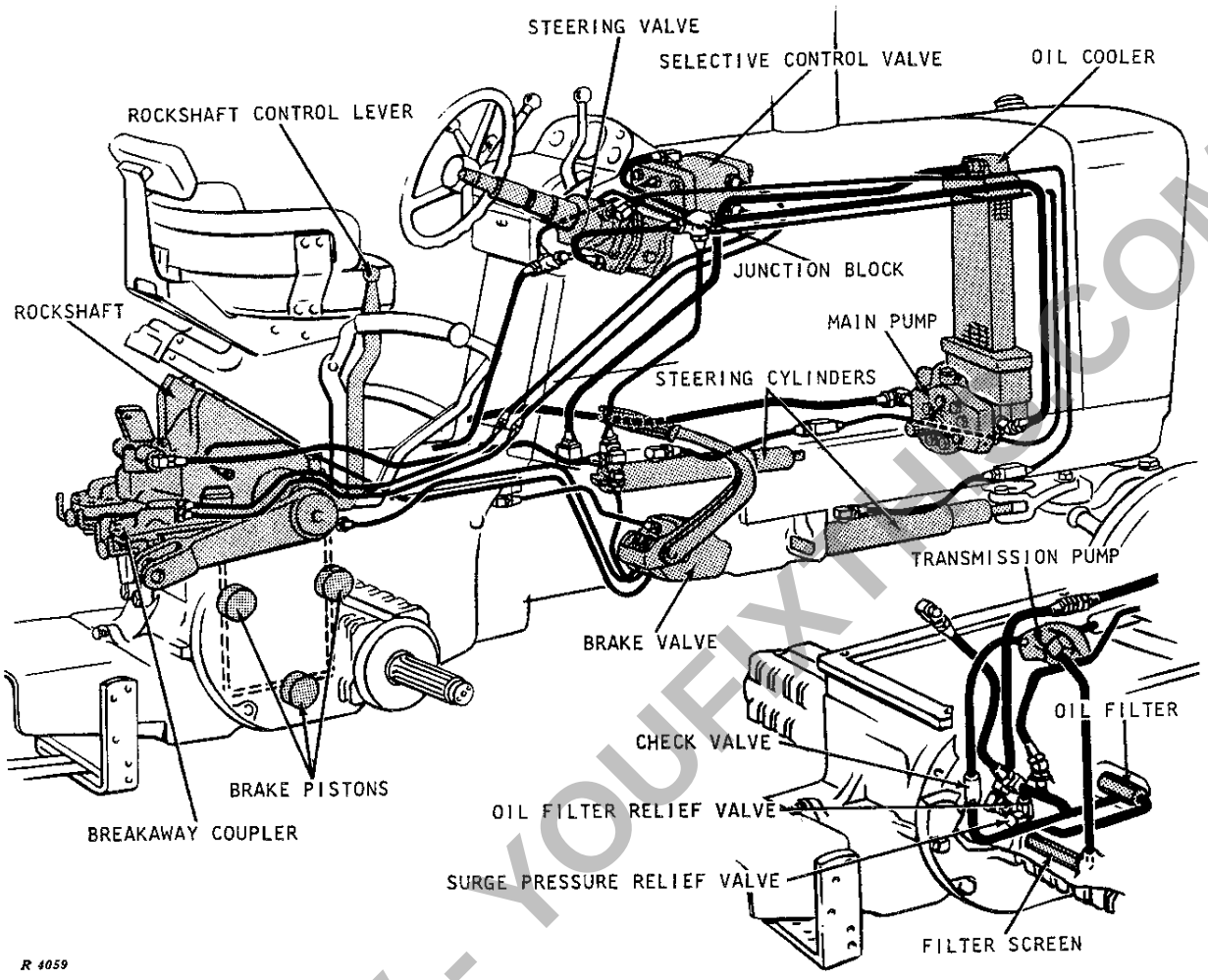


Fig. 240-5-2—Hydraulic System Components

In the case of the hydraulic system on 3000 Series Tractors, "closed-center" means that, when the operating valves which control the hydraulic mechanisms are in the neutral position, there is no flow of oil through the valves.

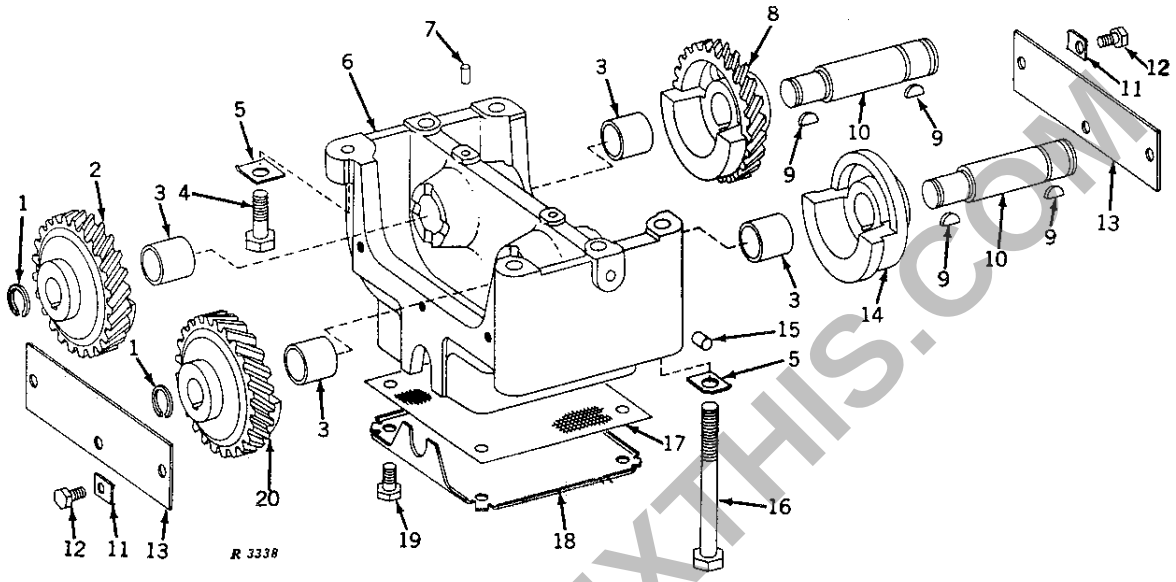
"Constant-pressure" means that as long as the engine and pump are running, a constant standby oil pressure of approximately 2250 psi is maintained in the system. Pressure oil is available instantaneously to go to work when any one of the operating valves is opened.

MAIN PUMP

The entire hydraulic system depends for its oil supply on an eight-piston, constant-running, variable-displacement pump (Fig. 240-5-3) mounted under the radiator and driven directly by the engine crankshaft. Spring-loaded, poppet-type valves are located in the pump inlet and discharge passages. The pistons, contained in bores drilled radially around the circumference of the pump, are actuated by a cam on the pump drive shaft.

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ASSEMBLING AND INSTALLATION



1 - Snap Ring
2 - L.H. Balancer Gear
3 - Bushing
4 - Cap Screw
5 - Lock Plate
6 - Balancer Housing
7 - Dowel Pin
8 - Balancer Driven Gear
9 - Woodruff Key
10 - Shaft
11 - Lock Plate
12 - Cap Screw
13 - Plate
14 - Balancer Weight
15 - Dowel Pin
16 - Cap Screw
17 - Oil Pump Intake Screen
18 - Screen Frame
19 - Cap Screw
20 - R.H. Balancer Gear

Fig. 50-30-9 -- Exploded View of Balancer

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Section 330
TROUBLE SHOOTING

Group 5
INDEX TO COMMON DIFFICULTIES

INTRODUCTION

Whenever service of a 3000 Series Tractor is required, due to a complaint or failure, the serviceman must be able to determine the cause or causes and to find the quickest and easiest solution.

If he can do this without costly and time-consuming disassembly, the job will go faster, costs will be reduced, and customer-irrating delays may be avoided.

The purpose of this Section is to help the serviceman diagnose quickly and easily most of the problems or failures with which he will be faced. Each difficulty that may develop in a specific component or system of the tractor is provided in one Group of this Section. For instance, faults or failures that may be found in the tractor engine are given in one Group (Group 10), those that may be found in the electrical system are given in another Group (Group 30), etc. Following each difficulty is a list of the possible causes and their remedies plus references to supplementary service information given in other Sections of this manual.

Using this information as a guide, the serviceman can diagnose the trouble by an orderly process of eliminating probable causes one by one until the solution is found.

For ready reference, an index to the common difficulties listed in this Section is provided below.

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Group 15
SPECIFICATIONS

HORSEPOWER (2200 RPM)

Diesel Engine:

*Corrected Flywheel	69.47
PTO Observed	59.44
Drawbar Observed	54.54

Gasoline Engine:

*Corrected Flywheel	64.44
PTO Observed	55.09
Drawbar Observed	52.00

CAPACITIES: (U.S. Measurements)

Fuel Tank (Gasoline and Diesel)	25 gals.
Crankcase	8 qts.
Transmission - Hydraulic System	9-1/2 gals.
Cooling System (Diesel and Gasoline)	19 qts.
Remote Cylinder	1 qt.
Air Cleaner (Gasoline)	2-1/4 pints
Air Cleaner (Diesel)	4 pints
Belt Pulley	2-1/2 pints

GROUND SPEEDS:

14.9 x 28 Rear Tires

Gear	Operating Range (1500-2200 engine rpm)	Transport Speed** (2200-2500 engine rpm)	Rated Speed (1900 engine rpm)
1st	1.31 - 1.93 mph	1.93 - 2.20 mph	1.67 mph
2nd	2.07 - 3.04 mph	3.04 - 3.44 mph	2.62 mph
3rd	2.70 - 3.96 mph	3.96 - 4.50 mph	3.42 mph
4th	3.47 - 5.09 mph	5.09 - 5.78 mph	4.40 mph
5th	4.24 - 6.21 mph	6.21 - 7.06 mph	5.37 mph
6th	5.70 - 8.34 mph	8.34 - 9.46 mph	7.20 mph
7th	7.11 - 10.43 mph	10.41 - 11.85 mph	9.01 mph
8th	11.65 - 17.10 mph	17.10 - 19.42 mph	14.78 mph
Rev. 1***	2.62 - 3.85 mph	3.84 - 4.38 mph	3.32 mph
Rev. 2***	4.12 - 6.05 mph	6.05 - 6.87 mph	5.23 mph
Rev. 3***	6.92 - 10.15 mph	10.15 - 11.53 mph	8.76 mph

**Factory-corrected to standard sea level conditions (29.92 in. Hg. and 60° F.).*
***Controlled by foot throttle.*
**** - 1500-1900 engine rpm only.*

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DAILY OR EVERY 10 HOURS

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
1	Diesel engine crankcase	Check oil level	To "FULL" mark	Service DM or DS engine oil; Above 90° F.-SAE 30 or 20W-40 32° F. to 90° F. - SAE 20W or 10W-30. -10° F. to 32° F. - SAE 10W or 10W-30. Below -10° F.—SAE 5W or 5W-20.
	Gasoline engine crankcase	Check oil level	To "FULL" mark	Service MM or MS engine oil; Same as above temperature chart
2	Radiator	Check coolant level	To within 2 inches of top of filler tube	- - - - - - - - -
3	Air cleaner	Check for dirt and check oil level in cup	To top of inner bowl	Same as Item 1
4	Fuel pump (diesel and gasoline)	Check sediment bowl	- - - - - - - - -	- - - - - - - - -
5	Pre-cleaner	Check collector bowl	- - - - - - - - -	- - - - - - - - -
6	Front axle	Lubricate fittings	Several shots of grease	SAE multipurpose-type grease
7	Front wheels	Install fittings and lubricate when tractor is being operated in extremely wet and muddy conditions. See detailed instructions.	- - - - - - - - -	- - - - - - - - -

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Group 10
ENGINE REMOVAL AND INSTALLATION

Most service procedures on the engine can be done with the engine in the tractor. However, in the case of a general overhaul of the engine it is advisable that the engine be removed. Also, if the crankshaft is to be removed, or the camshaft bushings replaced, it will be necessary to remove the engine.

When removing the engine be very careful to avoid injury or damage. The job itself is relatively simple when correct procedure is followed. Be sure that the proper equipment is at hand to facilitate the removal. Do not attempt short cuts or serious injury to yourself or damage to the engine may result.

ENGINE REMOVAL

Drain radiator, block, and crankcase (Figs. 50-10-1, 50-10-2, and 50-10-3).

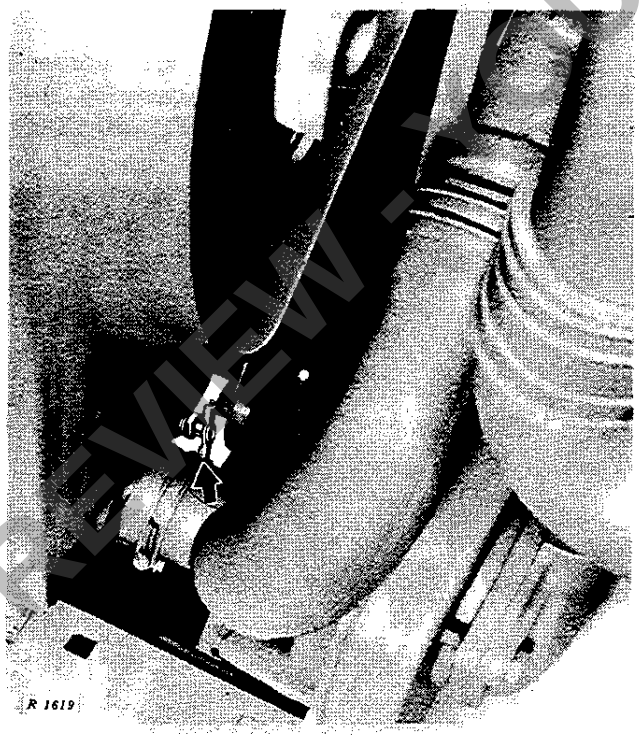


Fig. 50-10-1 -- Radiator Drain Cock

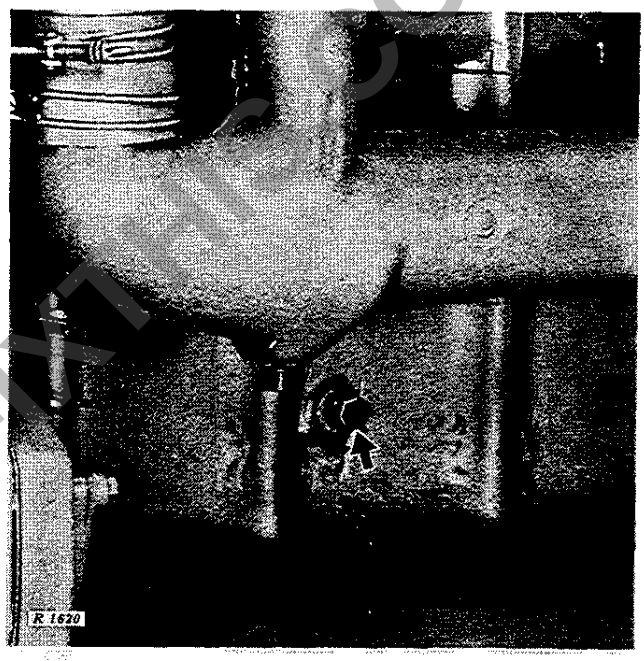


Fig. 50-10-2 -- Block Drain Plug

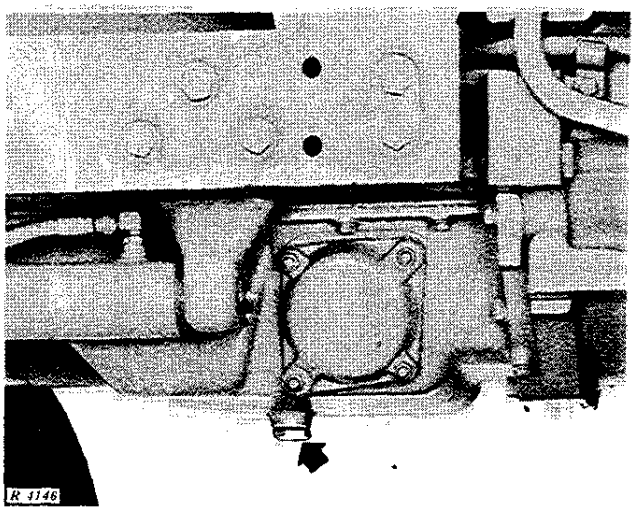


Fig. 50-10-3 -- Crankcase Drain Plug

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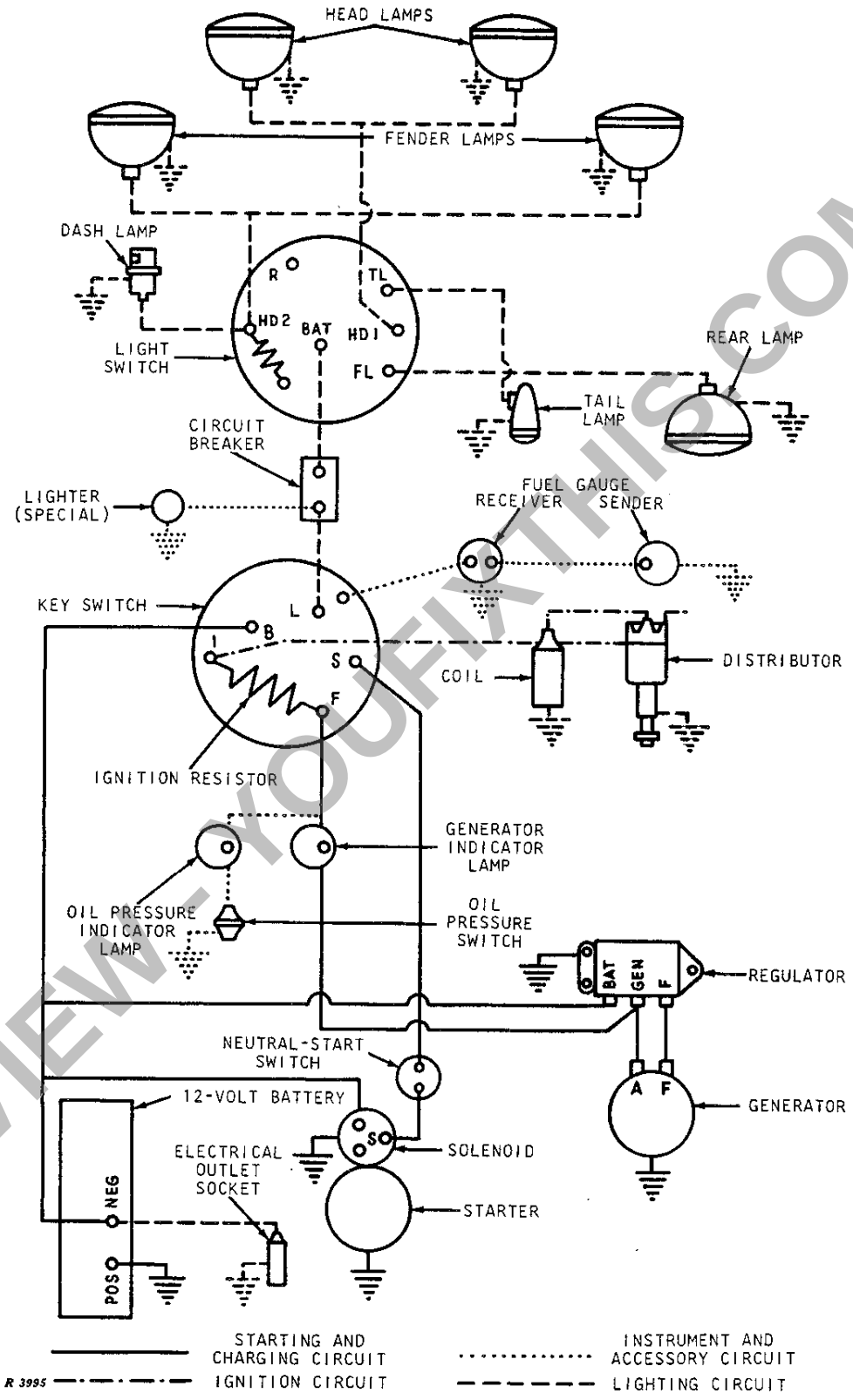


Fig. 200-5-3—Schematic Diagram of a Gasoline Tractor Electrical System (Grounded Circuit)

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OPERATION

Annular cored passages serve as inlet and outlet gallerys connecting together all eight pistons of the pump.

With initial rotation of the pump drive shaft (Fig. 260-10-5), the piston springs force the pistons inward against the drive shaft cam, causing a partial vacuum to exist at the outer or spring end of the pistons. At this moment the pressure of the inlet valve spring is overcome by oil pressure in the inlet gallery and the valve opens, allowing oil to enter, filling the area behind the piston. At the end of the intake stroke the inlet valve spring closes the valve. Further rotation of the drive shaft cam causes the piston to move outward forcing the trapped oil through the discharge valve into the outlet gallery. At the end of the pressure stroke the discharge valve spring closes the valve. This sequence of operations continues on each piston until the combined effort of all the pistons increases the pressure in the main pump gallery and the pump crankcase.

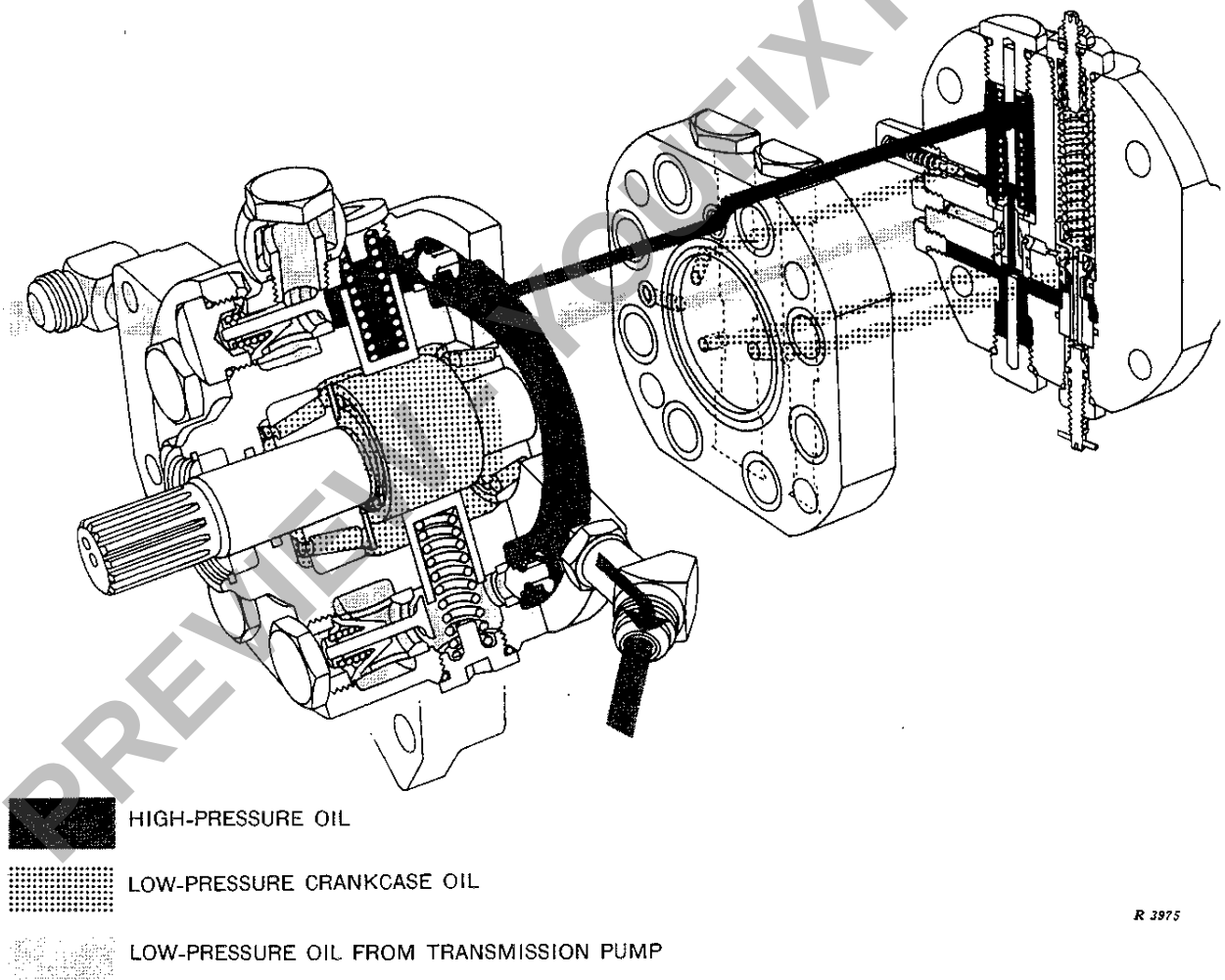


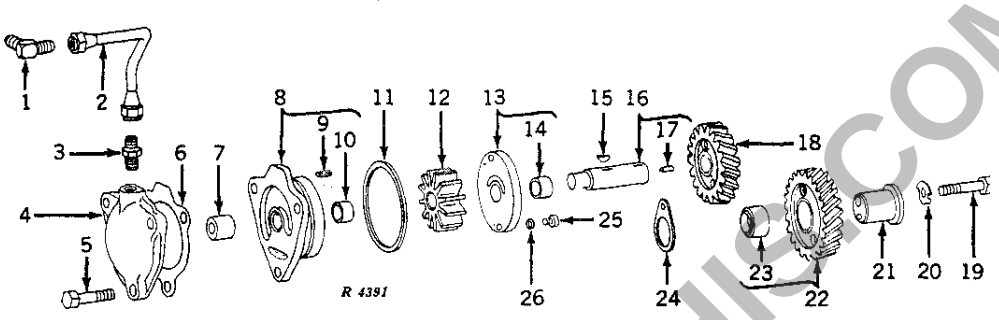
Fig. 260-10-5—Oil Flow Through Pump

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DISASSEMBLY AND SERVICE OF VENTILATOR PUMP

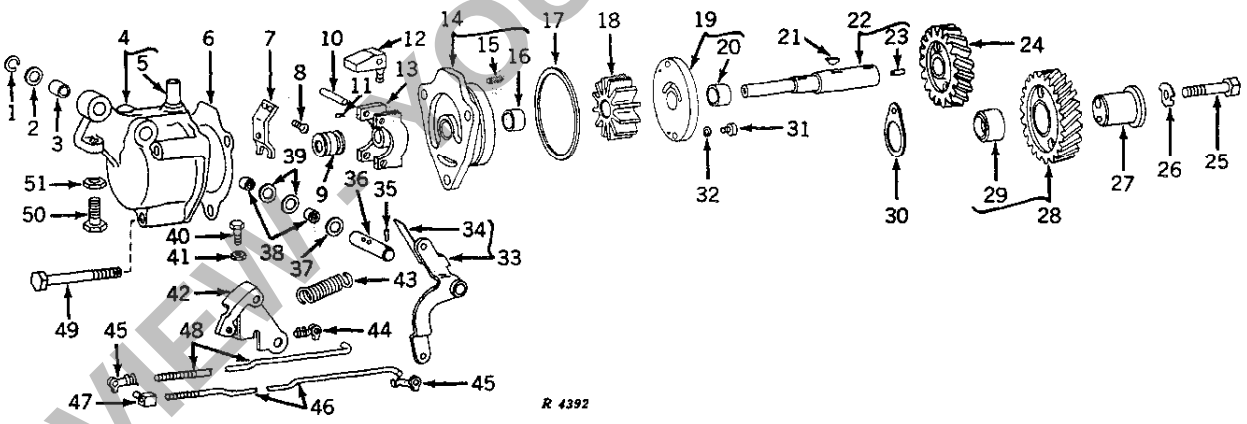
NOTE: There are only two differences between the diesel and gasoline ventilator pumps. The gasoline pump has a longer shaft than that of the diesel, and the gasoline shaft has the governor weight carrier on one end where a spacer is located on the diesel. (See exploded views.)

The ventilator pump can be cleaned without disassembling it. Soak entire assembly in clean solvent and blow out with compressed air.



1 – Elbow
2 – Ventilator Inlet Pipe
3 – Connector
4 – Ventilator Pump Inlet
5 – Special Cap Screw
6 – Gasket
7 – Spacer
8 – Ventilator Pump Housing
9 – Roll Pin
10 – Bushing
11 – Packing
12 – Ventilator Pump Impeller
13 – Ventilator Pump Cover
14 – Bushing
15 – Woodruff Key
16 – Pump Drive Shaft
17 – Dowel Pin
18 – Drive Gear
19 – Cap Screw
20 – Lock Plate
21 – Idler Gear Shaft
22 – Idler Gear
23 – Bushing
24 – Thrust Washer
25 – Special Cap Screw
26 – Lock Washer

Fig. 70-10-7–Ventilator Pump (Diesel)



1 – Retaining Ring
2 – Washer
3 – Bushing
4 – Governor Housing
5 – Tube (Not Furnished)
6 – Gasket
7 – Governor Lever
8 – Machine Screw
9 – Thrust Ball Bearing
10 – Governor Weight Pin
11 – Cotter Pin
12 – Governor Weight
13 – Governor Weight Carrier
14 – Ventilator Pump Housing
15 – Roll Pin
16 – Bushing
17 – Packing
18 – Ventilator Pump Impeller
19 – Ventilator Pump Cover
20 – Bushing
21 – Woodruff Key
22 – Governor Shaft
23 – Dowel Pin
24 – Drive Gear
25 – Cap Screw
26 – Lock Plate
27 – Idler Gear Shaft
28 – Idler Gear
29 – Bushing
30 – Thrust Washer
31 – Special Cap Screw
32 – Lock Washer
33 – Governor Arm
34 – Leaf Spring w/Rivet
35 – Roll Pin
36 – Governor Lever Shaft
37 – Oil Seal
38 – Needle Bearing
39 – Washer
40 – Cap Screw
41 – Jam Nut
42 – Speed Control Arm
43 – Spring
44 – R.H. Clevis Clip
45 – L.H. Clevis Clip
46 – Throttle Rod
47 – Swivel
48 – Speed Control Rod
49 – Special Cap Screw
50 – Cap Screw
51 – Jam Nut

Fig. 70-10-8–Governor and Ventilator Pump (Gasoline)

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Group 10
ENGINE DIFFICULTIES

Lack of Power

Possible Cause	Possible Remedy	Section, Group Reference
Air cleaner dirty or obstructed.	Clean cup and check filtering element in body for dirt.	90, 30 (gasoline); 100, 30 (diesel)
Obstruction in fuel line.	Remove fuel line and check flow from tank.	90, 10 (gasoline); 100, 10 (diesel)
Clutch slipping.	Adjust clutch.	110, 10
Governor binds.	Relieve bind.	70, 10
Dirt and oil restricting air intake passage.	Clean air cleaner and hoses. Also clean air cleaner intake pipe, precleaner, and oil trap.	90, 30 (gasoline); 100, 30 (diesel)
Wrong type of fuel.	Make sure correct grade of gasoline, or diesel fuel is used.	100, 5 (diesel)
Valve failure.	Recondition or replace as necessary.	50, 15
Incorrect valve clearance.	Adjust clearance.	50, 15
Low engine speed.	Check and adjust.	40, 10
Crankcase oil too heavy.	Fill crankcase with proper viscosity of oil.	30, 10
Poor compression	Check engine for leaky valves and worn or stuck piston rings. Replace or recondition as necessary and check valve clearance.	40, 10
Improper hitching or belting to equipment.	Make sure that equipment is hitched or belted properly to the tractor.	Implement operator's manual
Operating in a gear too high for load.	Advise operator to operate in lower gear.	. . . .
Incorrect engine timing.	Time engine spark advance correctly.	200, 15
Carburetor set incorrectly or gummed up.	Clean and/or adjust carburetor.	90, 20 or 25

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ENGINE:
- Type . . . . . 4-cylinder, in-line, valve-in-head
- Bore and Stroke:
  - Diesel . . . . . 4-1/8 in. x 4-3/4 in.
  - Gasoline . . . . . 4 in. x 4 in.
- Displacement:
  - Diesel . . . . . 254 cu. in.
  - Gasoline . . . . . 201 cu. in.
- Compression Ratio:
  - Diesel . . . . . 16.5 to 1
  - Gasoline . . . . . 7.50 to 1

LUBRICATION SYSTEM:
- Type . . . . . Force-feed pressurized type with full-flow oil filter

FUEL SYSTEM:
- Type . . . . . Gasoline and Diesel
- Air Cleaner . . . . . Oil-wash type (all tractors)

COOLING SYSTEM:
- Type . . . . . Pressurized system with centrifugal pump. Engine temperature controlled by two heavy-duty thermostats.

IGNITION SYSTEM (Gasoline):
- Type . . . . . Battery - distributor
- Distributor Point Gap . . . . . 0.022 in.
- Distributor Timing:
  - Gasoline . . . . . 20° BTDC

SPARK PLUGS:
- Size . . . . . 18 mm.
- Spark Plug Gap . . . . . 0.025 in.

ELECTRICAL SYSTEM:
- Battery Type:
  - Gasoline . . . . . One SAE 3 EM Agricultural
  - Diesel . . . . . Two SAE 3 EM Agricultural
- Battery Voltage:
  - Gasoline . . . . . 12 volts
  - Diesel . . . . . 24 volts

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EVERY 50 HOURS

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
8	Engine clutch	Lubricate throw-out bearing	2 shots of grease	SAE multipurpose-type grease
9	Power take-off clutch	Lubricate bearing	2 shots of grease	SAE multipurpose-type grease

EVERY 200 HOURS

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
10	Engine crankcase	Drain and fill Replace filter element	8 U.S. quarts	Same as Item 1
11	Air cleaner	Drain, clean, and fill	Fill to mark	Same as Item 1
12	Transmission and hydraulic system	Check oil level *Replace filter element	To top of "SAFE" range	John Deere Type 303 Special-Purpose Oil
13	Belt pulley	Check oil level	To level of filler hole	John Deere Type 303 Special-Purpose Oil
14	Power brakes	Bleed brakes	- - - - - - - - -	- - - - - - - - -
15	Batteries	Clean batteries and check electrolyte level	To bottom of filler neck	- - - - - - - - -
16	Generator belt	Check tension	1-inch flex with 25-pound force	- - - - - - - - -
17	Distributor (Gasoline)	Fill oil reservoir	Fill to level of filler hole	SAE 20W engine oil

* Perform this service on a new tractor at the end of the first 200 hours of operation only.

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Group 15
CYLINDER HEAD, VALVES AND RELATED PARTS, MANIFOLD AND MUFFLER

CYLINDER HEAD AND VALVES

DESCRIPTION

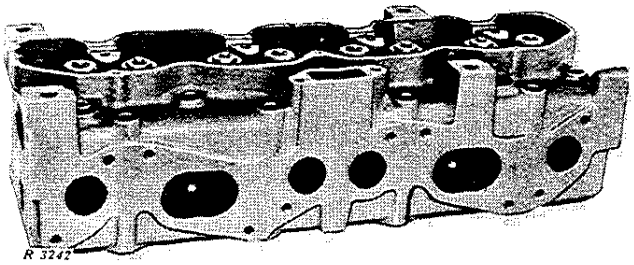


Fig. 50-15-1–Engine Cylinder Head

The cylinder head contains both intake and exhaust valves, intake and exhaust passages, and coolant passages (Fig. 50-15-1).

Valves are opened by rocker arms assembled on a rocker arm shaft and mounted in brackets on the head. These rocker arms are activated by the camshaft through cam followers and push rods. Valves are closed by springs, held in place with keepers, locks, and caps. Valve rotators are used on the exhaust valves in both engines.

Rocker arm adjusting screws, with lock nuts, are screwed into one end of each rocker arm to adjust valve lash between the valve stems and levers, and to assure the correct opening of the valves.

The sheet-metal rocker cover has a ventilator outlet tube to carry off crankcase vapors.

HEAD REMOVAL

NOTE: Refer to Group 10 of this section for directions and illustrations of the following procedure unless otherwise specified.

On both gasoline and diesel engines disconnect the battery, drain the cooling system, and remove the muffler and hood.

DIESEL ENGINE

Disconnect the generator-to-voltage regulator wires at the generator end. Remove the voltage regulator and bracket. Unfasten the generator at the adjusting bracket and let generator down, resting it against the side of the crankcase.

Remove the fuel bleed-back line, fuel injection lines, and fuel injectors (see Section 100 of this Manual).

Remove the manifolds, disconnect the upper and lower water hoses, and remove the water bypass line.

Remove the radiator, fan, and water pump assembly. (See Section 80 of this manual.)

CAUTION: Be careful. Do not let fan blades damage radiator core.

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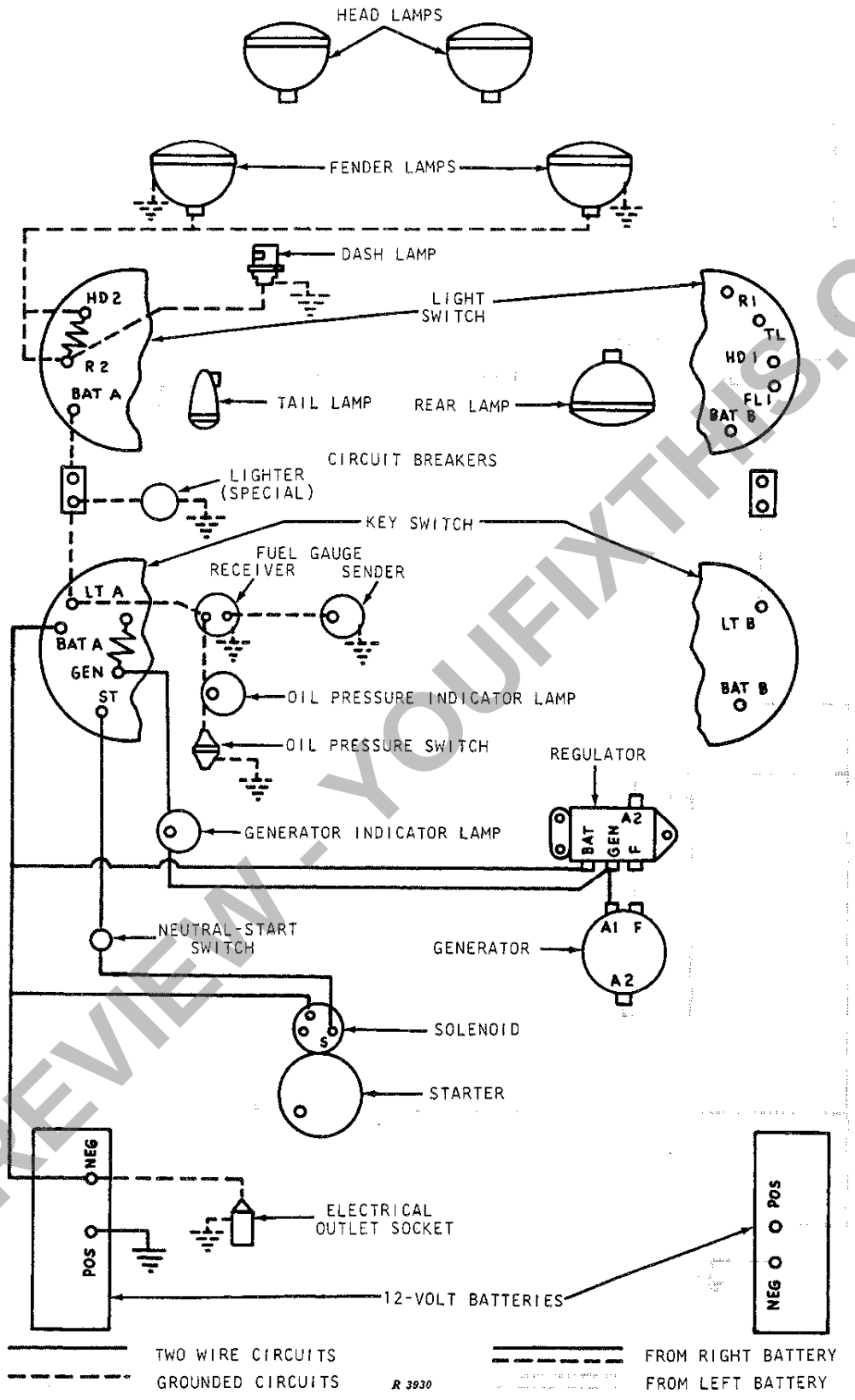


Fig. 200-10-1—Diesel Tractor Electrical System (Two-Wire and Split or Grounded Circuits)

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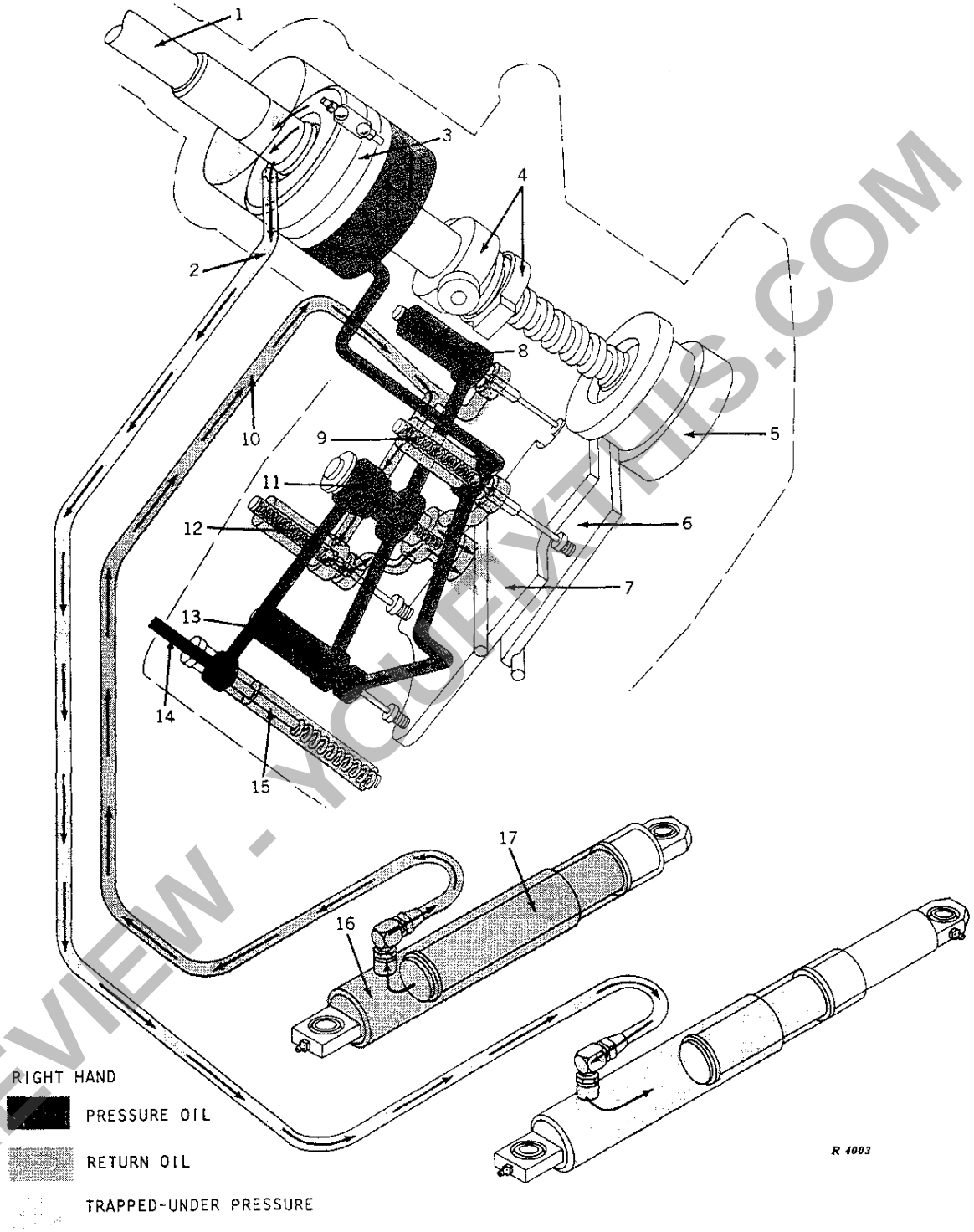
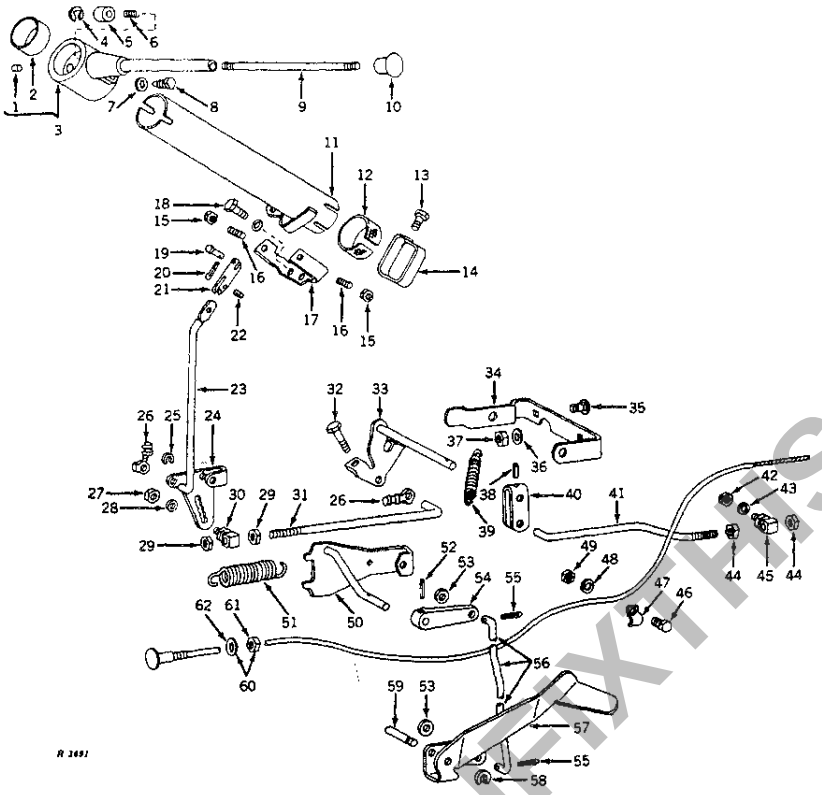


Fig. 270-5-4—Steering Valve and Cylinder Operation During a Right-Hand Turn (Power Operated)

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1 – Dowel Pin
2 – Bushing
3 – Hand Speed Control Hub
4 – Retaining Ring
5 – Guide
6 – Spring
7 – Lock Washer
8 – Special Cap Screw
9 – Hand Speed Control Lever Shaft
10 – Hand Speed Control Lever Knob
11 – Hand Speed Control Tube
12 – Hand Speed Control Tube Facing
13 – Cap Screw
14 – Hand Speed Control Clamp
15 – Jam Nut
16 – Set Screw
17 – Hand Speed Control Adjusting Bracket
18 – Cap Screw and Lock Washer
19 – Pin
20 – Cotter Pin
21 – Link
22 – Roll Pin
23 – Hand Speed Control Rod
24 – Hand Speed Control Bellcrank
25 – Retaining Ring
26 – R.H. Clevis Clip
27 – Jam Nut
28 – Washer
29 – Jam Nut
30 – Ball Joint
31 – Speed Control Link
32 – Special Cap Screw
33 – Speed Control Shaft
34 – Speed Control Bracket
35 – Rd. Hd. Bolt
36 – Lock Washer
37 – Nut
38 – Roll Pin
39 – Spring
40 – Speed Control Arm
41 – Speed Control Rod
42 – Jam Nut
43 – Lock Washer
44 – Jam Nut
45 – Ball Joint
46 – Cap Screw
47 – Clamp
48 – Lock Washer
49 – Jam Nut
50 – Foot Speed Control Arm
51 – Spring
52 – Roll Pin
53 – Washer
54 – Foot Speed Control Shaft Arm
55 – Cotter Pin
56 – Foot Speed Control Rod
57 – Foot Speed Control Pedal
58 – Retaining Ring
59 – Pivot Pin
60 – Fuel Shut-Off Cable
61 – Jam Nut
62 – Lock Washer

Fig. 70-10-14–Exploded View of Throttle Controls (Diesel)

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Lack of Power—Continued

Possible Cause	Possible Remedy	Section, Group Reference
Governor linkage not set right.	Adjust governor linkage.	40, 10
Faulty ignition equipment.	Inspect and repair ignition equipment.	200, 10
Wrong spark plugs.	Replace with properly gapped plugs of correct heat range.	200, 15
Distributor points pitted.	File (or replace) and adjust point gap according to specifications.	200, 15
Poor injection nozzle operation.	Remove and service nozzle.	100, 20
Low transfer pump pressure.	Clean transfer pump.	90, 15 (gasoline): 100, 25 (diesel)
Injection pump improperly timed.	Retime injection pump	100, 15
Incorrect camshaft timing.	Retime camshaft.	50, 30
Low operating temperature.	Check thermostats.	80, 15
Unequal injection pump fuel delivery.	Remove pump and test on test stand.	Fuel Injection Equipment Service Manual

Hard to Start

Water or dirt in fuel.	Drain and flush fuel system.	90, 10 (gasoline); 100, 10 (diesel)
Poor compression.	Check condition of valves and piston rings. Replace as necessary.	50, 15 and 20
Fuel shut-off closed.	Open fuel shut-off.	90, 10 (gasoline): 100, 10 (diesel)
Weak or no spark.	Check distributor point gap, spark plug gap, or defective wiring.	200, 15
Engine flooded.	Open throttle wide when starting.	. . . .
Weak or discharged battery.	Recharge or replace battery as necessary; check generator output.	200, 10
Governor linkage not set right.	Set governor linkage correctly.	40, 10
Carburetor out of adjustment.	Adjust carburetor correctly.	40, 10

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CLUTCHES:
- Engine . . . . . Foot-operated, 12-in. dry disk
- PTO . . . . . Hand-operated, 10-in. dry disk

BELT PULLEY:
- Diameter . . . . . 12 in.
- Width . . . . . 8-1/2 in.
- Engine Speed . . . . . 1900 rpm
- Pulley Speed . . . . . 980 rpm
- Belt Speed . . . . . 3077 fpm

TRANSMISSION:
- Type . . . . . Constant mesh
- Speeds . . . . . 8 forward and 3 reverse
- Gears . . . . . Helical
- Bearings . . . . . Taper roller
- Shifting . . . . . 4 stations

BRAKES:
- Type . . . . . Hydraulically power actuated, disk-type, operating in oil

POWER TAKE-OFF:
- Type . . . . . Single 1-3/8 in. PTO shaft with front and rear power take-off. Stub shafts for rear PTO conversion.
- Engine Speed . . . . . 1900 rpm
- PTO Speed:
  - Front PTO . . . . . 1000 rpm
  - Rear PTO . . . . . 540 or 1000 rpm
  - Rear PTO Ahead of Hitch Point . . . . . 540 rpm - 14 in.
  - Drawbar . . . . . 1000 rpm - 16 in.
  - PTO Shaft Above Ground . . . . . 22-5/8 in.

REAR AXLES:
- Diameter . . . . . 3-1/8 in.
- Bearings . . . . . Four taper roller
- Types Available . . . . . Regular, long, and extra long

FRONT TIRES:
- Size . . . . . 7.50 x 16, 8-ply, HD truck

REAR TIRES:
- Size . . . . . 14-92 14.9-28, 8-ply, Industrial

Additional size tires available for special applications.

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EVERY 200 HOURS-Continued

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
17 (cont.)	Distributor felt wick	Apply oil to felt wick	2-3 drops	SAE 20W engine oil
	Distributor cam	Apply lubricant to cam	Trace	Distributor cam lubricant
18	Tires	Check air pressure	See detailed instructions	- - - - - - - -

EVERY 600 HOURS

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
19	Transmission and hydraulic system	Replace filter element	- - - - - - - - -	- - - - - - - -
20	Belt pulley	Drain, flush, and fill	2-1/2 U.S. pints	John Deere Type 303 Special-Purpose Oil
21	Clutch pedal	Check free travel	5/8-inch with engine operating at 1900 rpm	- - - - - - - -
22	Fuel pump (diesel and gasoline)	Clean sediment bowl and fuel strainer	- - - - - - - - -	- - - - - - - -
23	Fuel filter and strainer (diesel)	Replace first stage filter element	- - - - - - - - -	- - - - - - - -
24	Intake and exhaust valves	Check valve clearance	Gasoline: 0.015-inch intake 0.028-inch exhaust Diesel: 0.018-inch intake and exhaust	- - - - - - - -

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DESCRIPTION

The crankshaft is a steel forging. The crankshaft in gasoline engines is carried in three main bearings while the diesel engine crankshaft is carried in five main bearings (Fig. 50-25-1).

Crankshaft end thrust is taken by the upper and lower halves of the center main bearing in the gasoline engine and by the third main bearing from the rear in the diesel engine. Main bearing inserts can be replaced without removing the crankshaft.

All crankshafts are drilled for pressure lubrication from the main bearings to the connecting rods. A ring gear between the 2nd and 3rd connecting rod journals drives the engine balancer (see Group 30 of this Section).

The diameter of the crankshaft main bearing journals is the same on both engines; 3.3720 to 3.3730 inches.

The flywheel bolting flange and crankshaft counterweights are forged integral with the shaft. The flywheel is positioned to the crankshaft by means of two dowel pins and secured with four 1/2-inch cap screws that have nylon inserts to prevent oil leakage.

The gear that drives the timing gears is located in the front of the crankshaft and is held in place by means of a press fit and key. The pulley that drives the fan and generator is secured to the crankshaft by means of a 5/8-inch cap screw, Woodruff key, and a press fit.

The rear oil slinger is heated and pressed on the shaft and provides a hardened surface for the lip-type oil seal. On engines equipped with a face-type seal, the slinger is not used.

MAIN BEARING CLEARANCE AND CRANKSHAFT END PLAY INSPECTION

(Crankshaft in Tractor)

Main bearing clearance and crankshaft end play can be checked with the engine IN the tractor. To check the main bearing clearance, remove the oil pan and the oil pump (see Section 60, Group 10 of this Manual). Crankshaft end play can be checked with the tractor and engine both in a complete state of assembly.

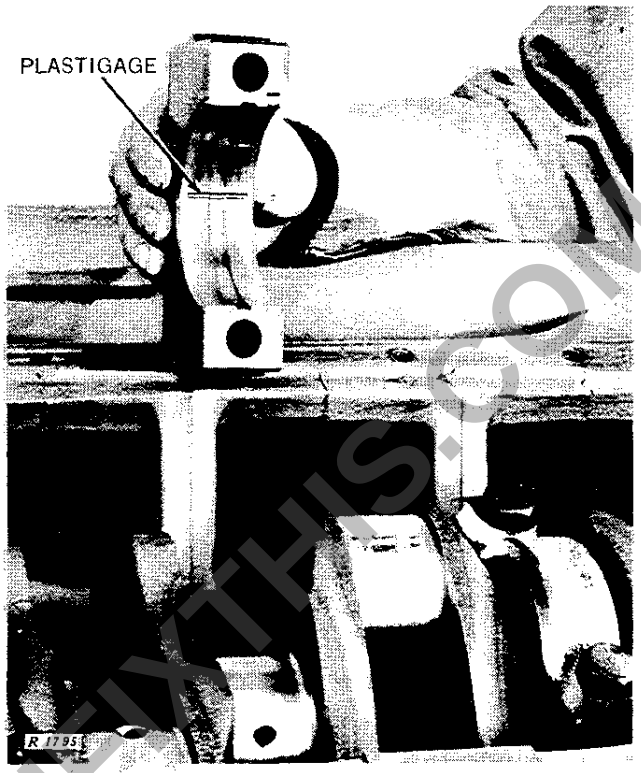


Fig. 50-25-2—Measuring Main Bearing Clearance with Plastigage

MAIN BEARING CLEARANCE

To check main bearing clearance, remove the main bearing cap and place a strip of "Plastigage," about three-fourths the width of the bearing, in the center of the cap (Fig. 50-25-2). Then replace the cap and tighten cap screws to 150 foot-pounds torque.

NOTE: Keep all bearing caps tight except the one being checked. Do not turn crankshaft.

Remove the cap and measure the thickness of the flattened "Plastigage" with a micrometer (Fig. 50-25-3) to determine the bearing clearance.

Specified clearance for main bearings in both gasoline and diesel engines is 0.0031 to 0.0061 inch.

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SERVICE MANUAL FOR JOHN DEERE DEALERS

3000 SERIES

WHEEL TRACTORS

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TO THE JOHN DEERE SERVICEMAN

This service manual contains maintenance instructions for John Deere 3000 Series Wheel Tractors. Included are complete instructions for removal, disassembly, inspection, repair, assembly and installation of the major parts and assemblies of the tractor.

In addition, the manual contains brief descriptions of the more complicated systems of the tractor, and tells how they operate. 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 efficiently, are explained in detail.

A section on "Tune-Up and Adjustment" contains instructions for performing the services necessary to help the tractor perform efficiently and economically after it has been in the field for some time.

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

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



John Deere 3010 Wheel Tractor with Loader and Backhoe

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INSTALLATION

When installing fuel tank, first connect the tank to the grille housing if the two had been separated during removal.

Set the tank and grille housing on the front end of the tractor as a unit. Install cap screws and lock washers and tighten securely.

Attach grille housing-to-radiator brace rod on the left side and install air cleaner hose, tightening clamps securely to prevent dust leaks at that point.

Connect head lamp wires and install front grille plate.

Install the grille housing-to-radiator brace rod (right side of tractor) and replace hydraulic line clamps, tightening them securely. Hook up fuel gauge sender wire and fuel leak-off line.

Connect fuel supply pipe beneath tank and open pet cock.

Replace hood and cowl and connect battery. Polarize generator by momentarily connecting a jumper wire between the regulator "BAT" and "GEN" terminals (see Section 200, Group 10). Fill tank with fuel and replace cap.

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Item	*Specification*

LIGHT BULBS

Indicator lamp bulbs (red coated, single contact)	431R, 12 to 16 V.
Beamed fender lamp (sealed unit)	4411, 12 V.
Front or rear flood lamp (sealed unit)	4407, 12 V.
Dash lamp (single contact)	6CP, 12 to 16 V.
Rear warning lamp (single contact)	21CP, 12 to 16 V.
Tail lamp (single contact)	6CP, 12 to 16 V.

FUSE

Fuse for electrical outlet socket	SFE 20 amps

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