John Deere
Service Manual
200, 210, 212, and 214
Lawn and Garden Tractors
SM-2105-(Oct-76)

John Deere Horicon Works
SM2105 (Oct-76)
LITHO IN U.S.A.
ENGLISH

JOHN DEERE 200, 210, 212 AND 214 LAWN AND GARDEN TRACTORS

Service Manual SM-2105 (Oct-76)

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(All information, illustrations, and specifications contained in this service manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.)

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INTRODUCTION

This service manual contains service and maintenance information for the John Deere 200, 210, 212 and 214 Lawn and Garden Tractors.

The manual is divided into sections. Each section pertains to a certain component or operational system of the tractor. The information is divided into groups within each section.

Emphasis is placed on diagnosing malfunctions, analysis and testing. Diagnosing malfunctions includes possible troubles, their causes and how to correct them. Under specific components these troubles are analyzed to help you understand what is causing the problem. In this way, you can eliminate the cause rather than just replace parts and have the same problem keep recurring.

Metric equivalents have been included, where applicable, throughout this service manual.

Specifications and special tools are found in the last group of each section.

This manual can be kept in its own cover or it can be filed in your service manual rack or in your Consumer Products Service Information Binder.

Whenever new or revised pages are provided, insert them into your manual as soon as you receive them. Your service manual will always be up-to-date and be a valuable asset in your service department.

⚠ This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

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Section 10
GENERAL
Group 5
TRACTOR IDENTIFICATION

CONTENTS

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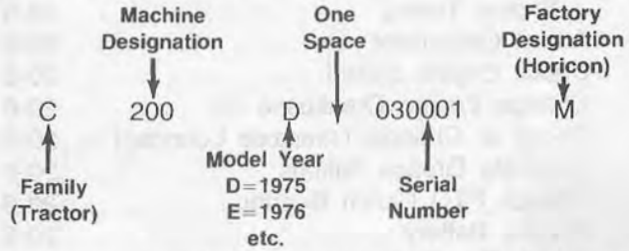
SERIAL NUMBERS

Tractor

Fig. 1-Tractor Serial Number

The tractor serial number, Fig. 1, is located on the pedestal below the steering wheel.

The first letter indicates the "family of machine"; the next three numbers or letters, the "model or machine designation"; the letter in the fifth position indicates the "model year". This is followed by a space (for computer purposes), and a six-digit serial number and the letter "M" denoting Horicon as the factory of manufacture.



When ordering parts, use only the six-digit serial number. When writing about or filling out warranty claims, use all thirteen numbers, letters and spaces shown on the machine serial number plate.

Engine

Fig. 2-Engine Serial Number

The engine serial number, Fig. 2, is located on the engine shroud.

Transaxle

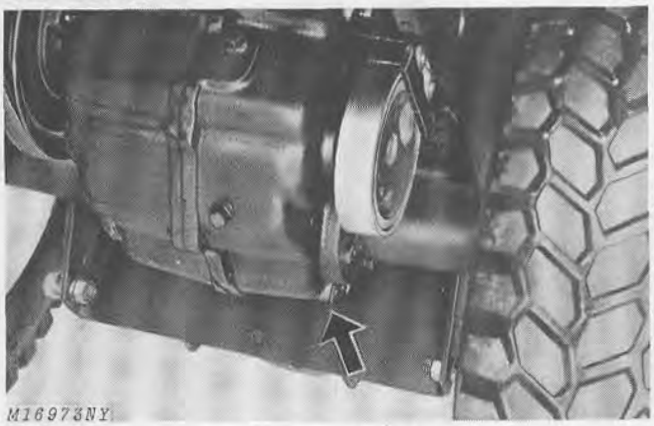


Fig. 3-Transaxle Serial Number

The transaxle serial number, Fig. 3, is located on the transaxle case next to the L.H. axle housing.

IDENTIFICATION CODES

Tire Codes

John Deere 200, 210, 212 and 214 Tractors are available with four different combinations of tires as follows:

Tire Code	Size Front	Size Rear	Tread
GT-3	16x6.50-8	23x8.50-12	High-Flotation
GT-4	4.80/4.00-8 ------	------ 23x8.50-12	Studded Traction
GT-5	16x6.50-8	23x10.50-12	High-Flotation
GT-8 Bar Tread	16x6.50-8 or 4.80/4.00-8 ------	------ 23x10.50-12	High-Flotation Traction

NOTE: The 200 Tractor is equipped with GT-3 tires as standard equipment. The 210, 212 and 214 Tractors are equipped with GT-5 tires as standard equipment.

Group 10
SPECIFICATIONS

ENGINE SPECIFICATIONS

Item	200	210	212	214
Engine Model No.	K181QS	K241AQS	K301AQS	K321AQS
Manufacturer	Kohler	Kohler	Kohler	Kohler
Cylinders	One	One	One	One
Stroke/Cycle	Four	Four	Four	Four
Bore	2.94 in. (7.46 cm)	3.25 in. (8.25 cm)	3.38 in. (8.58 cm)	3.50 in. (8.89 cm)
Stroke	2.75 in. (6.98 cm)	2.88 in. (7.31 cm)	3.25 in. (8.25 cm)	3.25 in. (8.25 cm)
Displacement	18.6 cu. in.	23.9 cu. in.	29.1 cu. in.	31.3 cu. in.
Speeds (Fast) No Load	3400 to 3500 rpm	3400 to 3500 rpm	3400 to 3500 rpm	3400 to 3500 rpm
Speeds (Idle)	1700 to 1900 rpm	1700 to 1900 rpm	1700 to 1900 rpm	1700 to 1900 rpm
Horsepower*	8	10	12	14
Normal Compression	110 to 120 psi	110 to 120 psi	110 to 120 psi	110 to 120 psi
Valve Clearance				
Intake (Cold)	0.007 in. (0.178 mm)	0.010 in. (0.254 mm)	0.010 in. (0.254 mm)	0.010 in. (0.254 mm)
Exhaust (Cold)	0.016 in. (0.406 mm)	0.020 in. (0.508 mm)	0.020 in. (0.508 mm)	0.020 in. (0.508 mm)
Ignition	Battery	Battery	Battery	Battery
Spark Plug	Champion-J-8 or XJ8 AC-45-M or R-46 Prestolite-14-7 or 14-R8	Champion-H-10 AC-45L Prestolite-14-L7B	Champion-H-10 AC-45L Prestolite-14-L7B	Champion-H-10 AC-45L Prestolite-14-L7B
Spark Plug Gap	0.025 in. (0.635 mm)	0.035 in. (0.889 mm)	0.035 in. (0.889 mm)	0.035 in. (0.889 mm)
Breaker Point Gap	0.020 in. (0.508 mm)	0.020 in. (0.508 mm)	0.020 in. (0.508 mm)	0.020 in. (0.508 mm)
Charging System	Alternator	Alternator	Alternator	Alternator
Starter	12-Volt	12-Volt	12-Volt	12-Volt
Air Filter	Dry-type	Dry-type	Dry-type	Dry-type

**The horsepower rating shown is established by the engine manufacturer in accordance with Standard Internal Combustion Engine Institute procedure. It is corrected at 60°F. and 29.22 in. Hg. Barometer and is developed from laboratory test engines equipped with standard air cleaner and muffler.*

BATTERY SPECIFICATIONS

Tractor	Battery
200	John Deere, 12 Volt, (AM30094), BCI Group U1, 135 cold cranking amps at 0°F. (−17°C), 30-minute reserve capacity.
210, 212, 214	John Deere, 12 Volt, (AM31186), BCI Group 22F, 255 cold cranking amps at 0°F. (−17°C), 55-minute reserve capacity.

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TRACTOR SPECIFICATIONS

Item	200	210, 212, 214
CAPACITIES		
Fuel Tank	3-1/2 U.S. Gallons (13.25 l)	3-1/2 U.S. Gallons (13.25 l)
Crankcase	2-1/2 U.S. Pints (1.18 l)	3 U.S. Pints (1.42 l)
Transaxle	3-1/2 U.S. Pints (1.65 l)	3-1/2 U.S. Pints (1.65 l)
Hydraulic System (Optional)	.....	2 U.S. Pints (0.94 l)
TRANSMISSION		
Type	Transaxle	Transaxle
Gear Selections	4 forward - 1 reverse	4 forward - 1 reverse
TRAVEL SPEEDS - @3400 rpm		
1st Gear (Variable)	0.3 to 0.9 mph (.6 to 1.6 kms/hr)	0.3 to 0.9 mph (.6 to 1.6 kms/hr)
2nd Gear (Variable)	1.0 to 2.7 mph (2.1 to 4.6 kms/hr)	1.0 to 2.7 mph (2.1 to 4.6 kms/hr)
3rd Gear (Variable)	1.8 to 4.7 mph (3.8 to 8.0 kms/hr)	1.8 to 4.7 mph (3.8 to 8.0 kms/hr)
4th Gear (Variable)	2.6 to 7.0 mph (5.5 to 11.9 kms/hr)	2.6 to 7.0 mph (5.5 to 11.9 kms/hr)
Reverse (Variable)	1.4 to 3.7 mph (2.4 to 5.3 kms/hr)	1.4 to 3.7 mph (2.4 to 5.3 kms/hr)
DIMENSIONS		
Wheelbase	46 in. (1.168 m)	46 in. (1.168 m)
Overall Length	67-1/2 in. (1.715 m)	67-1/2 in. (1.715 m)
Overall Height	42 in. (1.067 m)	42 in. (1.067 m)
Overall Width (maximum)	41-1/2 in. (1.054 m)	41-1/2 in. (1.054 m)
WHEEL TREAD		
Front	31 in. (78.74 cm)	31 in. (78.74 cm)
Rear (GT-3 Tires)	27 in. or 33 in. (68.58 cm or 83.82 cm)	27 in. or 33 in. (68.58 cm or 83.82 cm)
(GT-5 Tires)	28-1/2 in. or 31 in. (72.39 cm or 78.74 cm)	28-1/2 in. or 31 in. (72.39 cm or 78.74 cm)
BRAKES		
Type	Band, pedal-operated	Band, pedal-operated
Parking	Hand-lock foot brake	Hand-lock foot brake
CLUTCH	V-belt system	V-belt system
PTO CLUTCH	Manual	Manual
STEERING	Enclosed gear	Enclosed gear
LIFT*	Manual, Electric	Manual, Electric, Hydraulic
SHIPPING WEIGHT	691 lbs. (313 kg)	759 lbs. (344 kg)

Electric and Hydraulic Lifts are dealer installed options.

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TIRE SPECIFICATIONS

Tire Code	Location	Size	Tubeless	Ply-Rating	Tread	Tire Inflation Pressure
GT-3	Front	16x6.50-8	Yes*	2	High-Flotation	6 to 16 psi (41 to 110 kPa)
	Rear	23x8.50-12	Yes*	2		5 to 10 psi (34 to 69 kPa)
GT-4	Front	4.80/4.00-8	No	4	Studded Traction	12 to 40 psi (82 to 276 kPa)
	Rear	23x8.50-12	Yes*	2		5 to 10 psi (34 to 69 kPa)
GT-5	Front	16x6.50-8	Yes*	2	High-Flotation	6 to 16 psi (41 to 110 kPa)
	Rear	23x10.50-12	Yes*	2		5 to 10 psi (34 to 69 kPa)
GT-8 Bar Tread	Front**	16x6.50-8	Yes*	2	High-Flotation	6 to 16 psi (41 to 110 kPa)
	Rear	23x10.5-12	Yes*	2	Traction	5 to 10 psi (34 to 69 kPa)

**Tubes Available for service. See your parts catalog.*
***Use 4.80/4.00-8 front tires with front-end loaders.*

REAR WHEEL WEIGHT BOLT SIZE CHART

Tire/Wheel Option	Wheel Position	No. of Weights	Bolt Size
GT-3 or GT-4	Narrow	1	1/2 x 5-1/2
GT-3 or GT-4	Narrow	2	1/2x7-1/2
GT-3 or GT-4	Wide	1	1/2x5-1/2
GT-3 or GT-4	Wide	2	1/2x7-1/2
GT-5	Narrow	1	1/2x5-1/2
GT-5	Narrow	2	1/2x8
GT-5	Wide	1	1/2x5-1/2
GT-5 or GT-8	Wide	2	1/2x7-1/2

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BOLT TORQUE CHART

Grade of Bolt		SAE-2	SAE-5	SAE-8		
Min. Tensile Strength		64,000 PSI	105,000 PSI	150,000 PSI		
Grade Marking on Bolt					Socket or Wrench Size	
U.S. Standard					U.S. Regular	
Bolt Dia.	U.S. Dec. Equiv.	TORQUE IN FOOT POUNDS			Bolt Head	Nut
1/4	.250	6	10	14	7/16	7/16
5/16	.3125	13	20	30	1/2	1/2
3/8	.375	23	35	50	9/16	9/16
7/16	.4375	35	55	80	5/8	11/16
1/2	.500	55	85	120	3/4	3/4
9/16	.5625	75	130	175	13/16	7/8
5/8	.625	105	170	240	15/16	15/16
3/4	.750	185	300	425	1-1/8	1-1/8
7/8	.875	*160	445	685	1-5/16	1-5/16
1	1.000	250	670	1030	1-1/2	1-1/2

Multiply Readings by 12 for inch pound values.

**"B" Grade bolts larger than 3/4-inch are sometimes formed hot rather than cold which accounts for the lower recommended torque.*

NOTE: Allow a tolerance of plus or minus 10% on all torques given in this chart.

SET SCREW SEATING TORQUE CHART

Screw Size	Torque in Inch Pounds	
	Cup Point	Square Head
#5	9	—
#6	9	—
#8	20	—
#10	33	—
1/4	87	212
5/16	165	420
3/8	290	830
7/16	430	—
1/2	620	2100
9/16	620	—
5/8	1225	4250
3/4	2125	7700

Divide Readings by 12 for foot pound values
NOTE: Allow a tolerance of plus or minus 10% on all torques given in this chart.

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Group 15
FUEL AND LUBRICANTS

FUEL

Always use fresh, clean "regular grade or non-leaded" gasoline having an octane rating of 85 or higher. We recommend non-leaded gasoline because it reduces cylinder head deposits.

Do not use premium, ethyl or white gasoline. Never use special additives such as carburetor cleaners, de-icers, or moisture-removing liquids in your gasoline.

IMPORTANT: Do not mix oil with gasoline.

IMPORTANT: Do not permit dirt or other foreign matter to enter the fuel system. This could cause hard starting, poor performance and engine damage. Always use clean gasoline storage cans and funnels.

LUBRICANTS

Engine Crankcase

John Deere Torq-Gard Supreme engine oil is recommended because of its superior lubricating qualities. If a different brand of oil is used, it must conform to one of the following specifications.

SPI Service CD/SE, CD/SD, CC/SD or SD MIL-L-46152 or MIL-L-2104C*.

**As further assurance of quality, the oil should be identified as suitable for API Service Designation SD.*

IMPORTANT: Never put additives in the crankcase oil.

Depending on the expected prevailing temperature for the fill period, use oil of viscosity shown in the following chart.

Air Temperature	John Deere Torq-Gard Supreme Oil	Other Oils	
		Single Viscosity Oil	Multi-Viscosity Oil
Above 32°F	SAE 30	SAE 30	Not recommended
−10° to 32°F −23.3°C to 0°C	SAE 10W-20	SAE 10W	SAE 10W-30
Below −10°F −23.3°C	SAE 5W-20*	SAE 5W*	SAE 5W-20*

**Some increase in oil consumption may be expected when SAE 5W-20 or SAE 5W oils are used. Check oil level more frequently.*

Transaxle

John Deere AM30200 Transmission Lubricant or SAE 90 Gear Lubricant. Also an equivalent SCL Multipurpose-Type Gear Oil.

Tractor Grease Fittings

John Deere Multipurpose Lubricant SAE (Seasonal Grade) or equivalent Multipurpose-Type Grease.

Hydraulic System (Optional Equipment)

John Deere All-Weather Hydrostatic Fluid or an equivalent Type "F" Automotive Automatic Transmission Fluid.

CAPACITIES

Fuel Tank	3-1/2 U.S. gallons (13.25 l)
Crankcase:	2-1/2 U.S. pints (1.18 l)
200, 212, 214	3 U.S. pints (1.42 l)
Transaxle	3-1/2 U.S. pints (1.65 l)
Hydraulic System (optional equip.)	2 U.S. pints (0.94 l)

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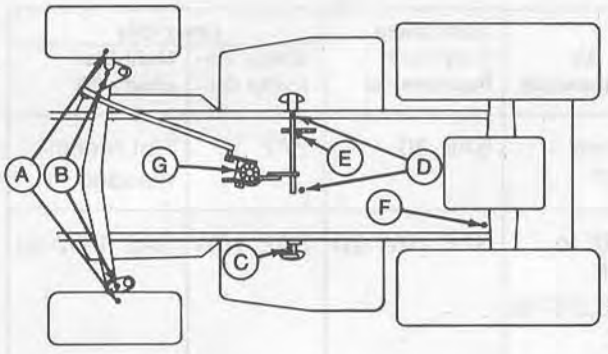
SERVICE INTERVALS

Lubricating Grease Fittings

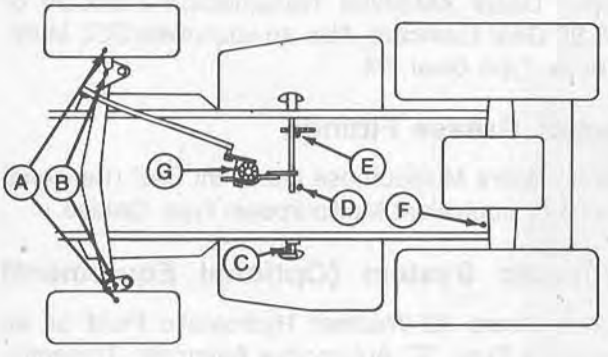
Grease tractor grease fittings in Spring and Fall Season. Tractor grease fitting locations are as follows:



M14459N

A—Front Wheel Hubs
B—Front Axle Spindles
C—Brake Pedal Shaft
D—Clutch Pedal Shaft
E—Primary Lift Shaft
F—Rear Brake Shaft
G—Steering Gear*

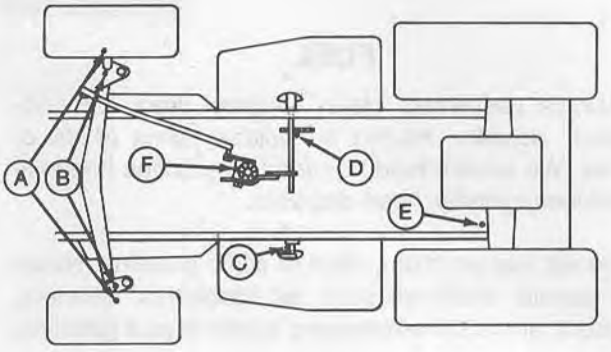
Fig. 1-Grease Fitting Locations (Serial No. 30,001-55,000)



M14460N

A—Front Wheel Hubs
B—Front Axle Spindles
C—Brake Pedal Shaft
D—Clutch Pedal Shaft
E—Primary Lift Shaft
F—Rear Brake Shaft
G—Steering Gear*

Fig. 2-Grease Fitting Locations (Serial No. 55,001-70,000)



M14461N

A—Front Wheel Hubs
B—Front Axle Spindles
C—Brake Pedal Shaft
D—Primary Lift Shaft
E—Rear Brake Shaft
F—Steering Gear*

Fig. 3-Grease Fitting Locations (Serial No. 70,001-)

***IMPORTANT: Do not overlubricate steering column fitting. Only 3 to 4 strokes with a hand grease gun are necessary. Do not use a high-pressure grease gun on this fitting.**

Changing Engine Crankcase Oil

Change crankcase oil after the first 2 hours of operation and every 25 hours of operation thereafter.

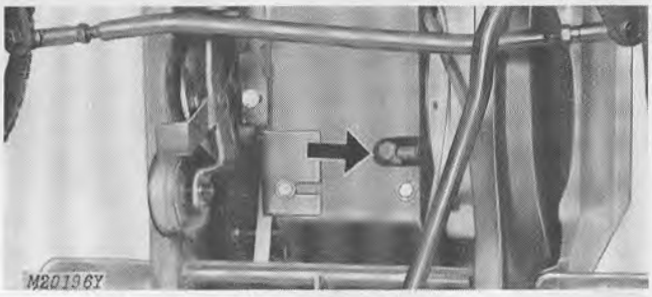


Fig. 4-Draining Crankcase Oil

NOTE: For convenience, a suitable length of 5/8-inch (15.88 mm) garden hose or plastic tubing may be installed on the drain valve to allow oil to drain.

Open oil drain valve Fig. 4 and allow oil to drain into a container.

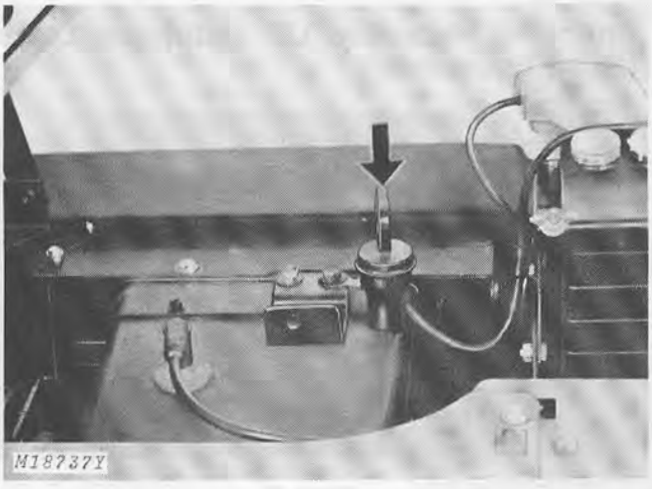
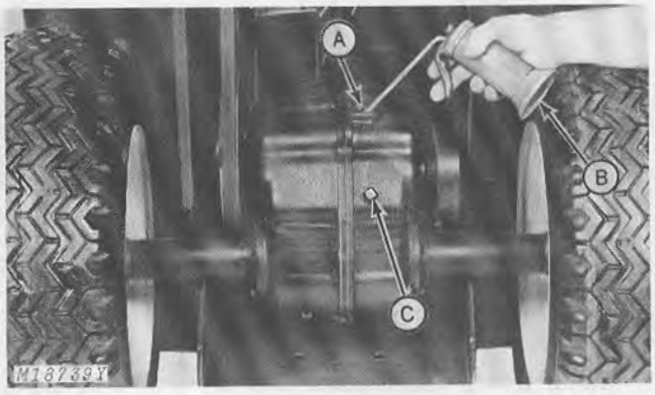


Fig. 5-Filling Crankcase

Close oil drain valve. Fill crankcase with oil of the proper viscosity to "F" mark on dipstick Fig. 5 (see page 10-15-1 for crankcase capacity).

Changing Transaxle Lubricant



A—Oil Level Filler Hole
B—Pressure Oil Can
C—Drain Plug

Fig. 6-Changing Transaxle Lubricant

Change transaxle lubricant every 2 years or 500 hours of operation. Remove transaxle drain plug (C) and drain oil. Wipe plug clean and replace it in transaxle.

Remove plug from filler hole (A) and fill transaxle with 3-1/2 U.S. pints (1.65 l) of AM30200 Transmission Lubricant, SAE 90 Gear Lubricant or an equivalent SCL Multipurpose Gear Oil.

Repacking PTO Clutch Bearing

Repack PTO clutch bearing, each spring and fall.

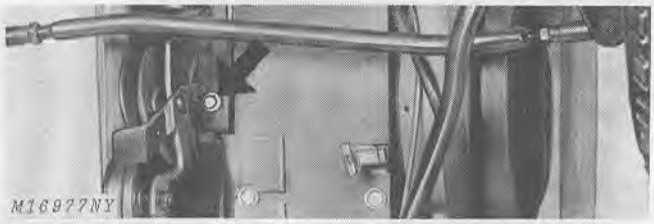


Fig. 7-PTO Clutch Brake Cap Screw

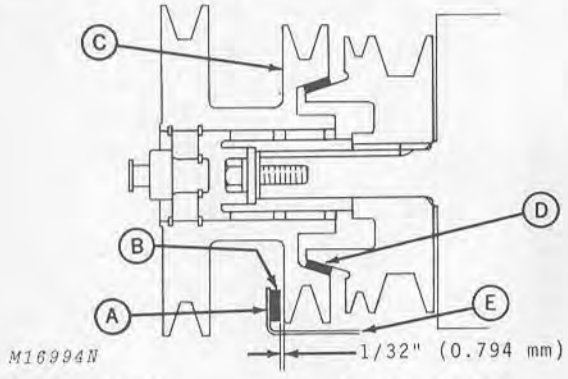
Using a 1/2-inch socket wrench with extension, loosen PTO clutch brake cap screw, Fig. 7, only enough to permit removal of PTO clutch assembly.

Pivot clutch arm clip upward and slide clutch arm to the rear to remove clutch arm from sheave hub.

Slide PTO assembly off the shaft. Check condition of clutch and brake linings. Replace linings as necessary. Use solvent to remove old grease from bearing.

Dry bearing thoroughly and repack it with John Deere High-Temperature grease (AT30408) or its equivalent.

Install PTO assembly on shaft and replace clutch arm. Lock in place with clip.



A—Clutch Brake
B—Brake Lining
C—Clutch Cup Sheave
D—Clutch Lining
E—Brake Shoe

Fig. 8-Adjusting Clearance Between Brake and Sheave

Engage PTO clutch lever (up position). Check distance between the clutch brake (A) and clutch cup sheave (C) for 1/32-inch (0.794 mm) clearance, Fig. 8.

If adjustment is required, use a 1/2-inch socket with extension. Loosen clutch brake cap screw, Fig. 7. Slide brake shoe in slotted hole until proper adjustment is obtained. Tighten cap screw.

Lubricating Integral Hitch Grease Fitting (Extra Equipment)

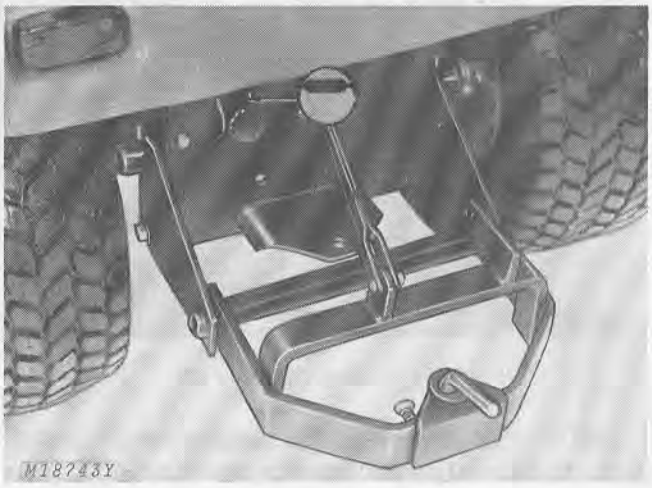


Figure 9-Integral Hitch (Extra Equipment)

If the tractor is equipped with an integral hitch (extra equipment) lubricate the rear lift pivot, Figure 9.

Checking Hydraulic Lift Lubricant Level (Extra Equipment)

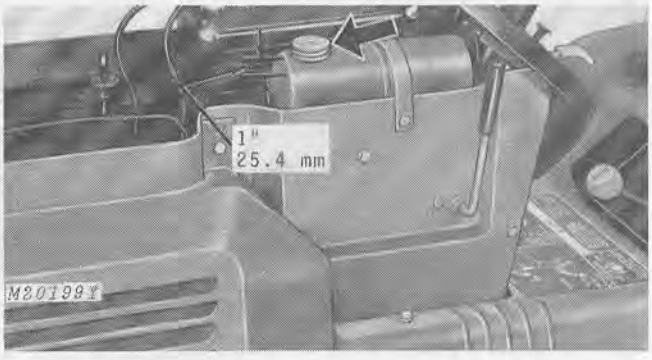


Figure 10

Once a week or every 50 hours of operation, check hydraulic fluid level. Park the tractor on a level surface, shut off engine, and set parking brake.

Remove reservoir cap (arrow). The hydraulic fluid level should be within 1 inch (25.4 mm) from top of reservoir. If hydraulic fluid is required, use John Deere All-Weather Hydrostatic Fluid or an equivalent Type "F" automatic transmission fluid.

Group 20
TUNE-UP AND ADJUSTMENTS

PURPOSE OF TUNE-UP AND ADJUSTMENTS

Generally, the customer complaint will reveal which system or component requires checking. However, when dealing with the entire tractor, it is recommended that the step-by-step procedures outlined on the following pages be used.

VISUAL INSPECTION

Much can be learned about the general condition of the tractor by a thorough visual inspection. For convenience, remove the side panels and hood.

Check the engine, transaxle and hydraulic system (if so equipped) for evidence of oil leakage.

Inspect battery for excessive corrosion, cracked case, proper installation and cable connections. Note general condition of wiring harness. Be sure the harness is not oil-soaked and that it is not frayed or damaged.

ENGINE TUNE-UP

Engine tune-up is making minor repairs and adjustments in an orderly sequence to improve the overall efficiency and operation of the engine.

Tune-up includes checking, adjusting and servicing the electrical, ignition, air intake, fuel and lubrication systems.

TRACTOR ADJUSTMENTS

Adjusting tractor components insures that engine horsepower will be utilized in the most efficient manner.

Adjustments to be made on the tractor include: Checking or changing transaxle lubricant, lubricating grease fittings, checking PTO clutch and brake, tractor brakes, belts and equipment.

TUNE-UP GUIDE

The following guide offers an orderly sequence for servicing a tractor that has been running well.

Also use this guide to explain to your customers what a tune-up includes. Be sure to obtain customer permission before performing these services.

1. Clean Engine Shrouds and Cooling Fins
2. Clean or Replace Air Filter Element
3. Clean Fuel Strainer
4. Check and Clean Engine Crankcase Breather
5. Check Spark Plug Gap
6. Check Ignition Breaker Points and Engine Timing
7. Adjust Carburetor
8. Check Engine Speed
9. Change Engine Crankcase Oil
10. Check or Change Transaxle Lubricant
11. Lubricate Grease Fittings
12. Repack PTO Clutch Bearing
13. Service Battery
14. Check Tire Pressure
15. Check Operation and Condition of:
    (A) Lights
    (B) Lift System
    (C) Steering
    (D) Brakes (PTO Clutch and Tractor)
    (E) Belts and Equipment

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TUNE-UP AND ADJUSTMENTS

1. Clean Engine Shrouds and Cooling Fins

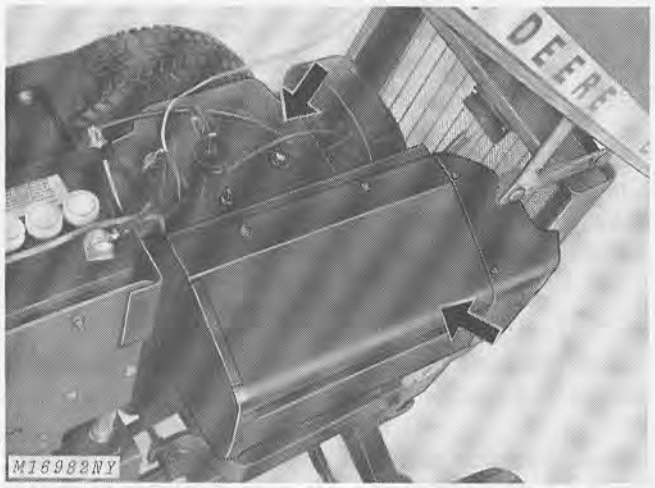

Fig. 1-Engine Shrouds

Remove engine shrouds, Fig. 1. Blow out cooling fins with compressed air. Be sure all dirt and debris are removed from the engine.

2. Clean or Replace Air Filter Element

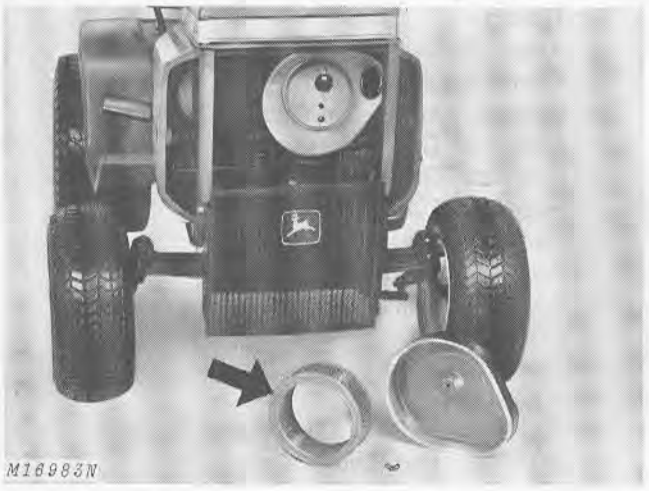

Fig. 2-Air Filter Element

Remove the air filter element, Fig. 2. Tap the filter lightly against a flat surface and brush out dust. Do not clean filter with a liquid cleaner or compressed air.

Replace filter if it is bent, crushed, damaged or extremely dirty.

3. Clean Fuel Strainer

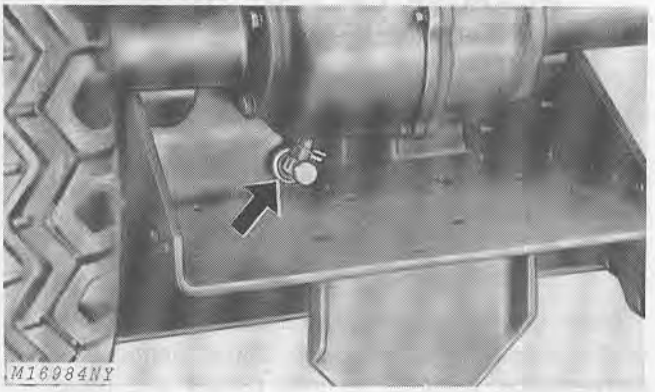

Fig. 3-Fuel Shut-Off Valve

Close the fuel shut-off valve, under fuel tank, Fig. 3. Disconnect hose from valve. Attach a 12-inch length of 1/4-inch hose and drain fuel tank into a clean container.

Remove hose from valve. Unscrew shut-off valve with strainer from fuel tank. Thoroughly clean all particles from strainer.

Install shut-off valve and strainer assembly. Close the valve, connect the hose, and fill fuel tank.

4. Check and Clean Engine Crankcase Breather

A clogged crankcase breather can cause positive pressure to build up in the crankcase.

Check crankcase vacuum with a U-tube water manometer.

An engine in good condition and operating at normal temperatures will show a 5 to 10-inch water column on the manometer.

An engine in good condition and operating at normal engine temperatures will show a 5 to 10-inch water column of vacuum or negative pressure on the manometer, (see Fig. 4).