

**110 and 112
Lawn and
Garden Tractors
Serial No.
(100,001 - 250,000)**



JOHN DEERE

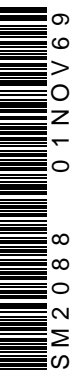
SERVICE MANUAL

110 and 112 Lawn and Garden Tractors
Serial No. (100,001 - 250,000)

SM2088 (01NOV69) English

**John Deere
Lawn & Grounds Care Division
SM2088 (01NOV69)**

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ENGLISH



Service Manual

110 AND 112 LAWN AND GARDEN TRACTORS

(Serial No. 100,001-)

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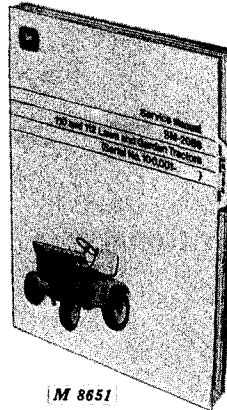
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INTRODUCTION



Service Manual

This service manual contains service and maintenance information for John Deere 110 and 112 Lawn and Garden Tractors (Serial No. 100,001-).

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.

Specifications and special tools are found at the end of the Groups for easy reference.

This manual can be kept in its own cover, or it can be removed and filed in your service manual rack or placed behind the service manual tab in your Lawn and Garden Parts and Service 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.

Section 10 GENERAL

Group 5 TRACTOR IDENTIFICATION

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SERIAL NUMBERS

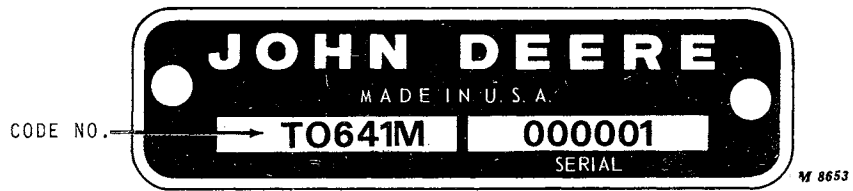
Each lawn and garden tractor is assigned an individual serial number. Serial numbers are written in parentheses throughout this manual for the reasons shown below. All serial number references are tractor serial numbers and not engine specification numbers.

- (0000-) When a serial number appears before the dash, the design change was introduced beginning with that serial number and is still current.
- (-0000) When a serial number appears after the dash, the design change was effective up to and including that serial number and is no longer effective.
- (0000-0000) When a serial number appears both before and after the dash, the design change was effective with the first serial number, but is no longer effective after the second serial number.

VINTAGE INFORMATION

| Year Manufactured | 110 Tractor | 112 Tractor Tecumseh | 112 Tractor Kohler |
|----------------------|-----------------------|-------------------------|-----------------------|
| | Tractor Serial No. | Tractor Serial No. | Tractor Serial No. |
| 1968 | (100,001-130,000) | (100,001-130,000) | |
| 1969 | (130,001-150,000) | (130,001-150,000) | (150,001-160,000) |
| 1970 | (160,001-185,000) | (160,001-180,000) | (160,001-225,000) |
| 1971 | (185,001-) | (185,001-) | (225,001-) |

SERIAL NUMBER PLATE



IDENTIFICATION CODES

The tractor identification code is indicated on tractor serial number plates.
 See the chart below for tractor identification codes.

| Tractor | Manual Lift | Hydraulic Lift | Code No. |
|----------------|-------------|----------------|----------|
| 110 | X | | 0641M |
| 110 | | X | 0647M |
| 112 (Tecumseh) | X | | 0651M |
| 112 (Tecumseh) | | X | 0657M |
| 112 (Kohler) | X | | 0652M |
| 112 (Kohler) | | X | 0653M |

Group 10 SPECIFICATIONS

ENGINE SPECIFICATIONS

| | 110 Tractors | 112 Tractors (Tecumseh) | 112 Tractors (Kohler) |
|--|--------------------|----------------------------|--------------------------|
| MODELS | | | |
| Manual Lift | 110 | 112 | 112 |
| Hydraulic Lift | 110H | 112H | 112H |
| ENGINE | | | |
| Manufacturer | Kohler | Tecumseh | Kohler |
| Model | K 181 S | HH 100 | K 241 AS |
| Cylinders | One | One | One |
| Cycle | 4 | 4 | 4 |
| Bore and Stroke | 2.94 x 2.75 in. | 3.31 x 2.75 in. | 3.25 x 2.875 in. |
| Displacement | 18.63 cu. in. | 23.75 cu. in. | 23.9 cu. in. |
| Speeds (Fast) | 1800-3800 rpm | 1800-3800 rpm | 1800-3800 rpm |
| Speeds (Idle) | 1200-1700 rpm | 1200-1700 rpm | 1200-1700 rpm |
| Horsepower (Engine Manufacturers' Rating)* | 8 @ 3600 rpm (*) | 10 @ 3600 rpm (*) | 10 @ 3600 rpm (*) |
| Normal Compression | 110-120 psi | 110-120 psi | 110-120 psi |
| Valve Clearance (intake) cold | 0.007 in. | 0.010 in. | 0.010 in. |
| Valve Clearance (exhaust) cold | 0.016 in. | 0.020 in. | 0.020 in. |
| FILTERS | | | |
| Air | Dry Filter | Dry Filter | Dry Filter |
| Gasoline | In-Line Strainer | In-Line Strainer | In-Line Strainer |

ELECTRICAL SYSTEM

| | | | |
|-------------------------|-------------------------------|-------------------------------|-------------------------------|
| Battery | 12 Volt | 12 Volt | 12 Volt |
| Ignition | Magneto | Solid State (* *) | Battery-Coil |
| Spark Plug Gap | 0.025 in. | 0.030 in. | 0.020 in. |
| Breaker Point Gap | 0.020 in. | Not required (* *) | 0.020 in. |
| Trigger Air Gap | Not required | 0.006-0.010 in. | Not required |
| Charging System | Alternator w/Rectifier | Alternator w/Rectifier | Alternator w/Rectifier |
| Starter | 12 Volt Motor w/Gear Drive | 12 Volt Motor w/Gear Drive | 12 Volt Motor w/Gear Drive |

* The horsepower ratings shown are established by the engine manufacturer in accordance with standard internal combustion engine institute procedure. They are corrected to 60°F. and 29.9 in. on a mercury barometer and are developed from laboratory test engines equipped with standard air cleaner and muffler.

* * Battery-coil ignition beginning with Serial No. 161,772. Breaker point gap 0.020 inch.

CAPACITIES

| Cavities | 110 Tractors | 112 Tractors (Tecumseh) | 112 Tractors (Kohler) |
|---------------------------------------|--------------------------|----------------------------|--------------------------|
| | Fuel Tank - U.S. Gallons | 1.75 | 1.75 |
| Crankcase - U.S. Pints | 2.5 | 2.5 (* * *) | 3.0 |
| Transaxle - U.S. Pints | 3.5 | 3.5 | 3.5 |
| Hydraulic Lift System - U.S. Pints | 2.5 | 2.5 | 2.0 |

* * * 3 U.S. pints beginning with Serial No. 161,772.

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FUEL AND LUBRICANTS

| | |
|------------------------------|---|
| Fuel | Regular Gasoline |
| Crankcase Lubricant | AM30730 Summer (SAE 30) AM30710 Winter (SAE 5W-20) |
| Transmission Lubricant | AM30200M Lubricant |
| Hydraulic System | Automatic Transmission Fluid—Type A |

TRANSMISSION AND AXLE

| | |
|--|--------------------------|
| TRANSMISSION | |
| Type | Transaxle |
| Gear Selections | 4 Forward—1 Reverse |
| TRAVEL SPEEDS (@ 3600 RPM Engine Speed) | |
| 1st Gear | Variable, .4 to 1.0 mph |
| 2nd Gear | Variable, 1.3 to 2.9 mph |
| 3rd Gear | Variable, 2.4 to 5.0 mph |
| 4th Gear | Variable, 3.4 to 7.4 mph |
| Reverse | Variable, 1.8 to 3.3 mph |

BRAKES, CLUTCH AND STEERING

| | |
|-----------------------|-------------------------------|
| BRAKES | |
| Type | Drum and shoe, Pedal Operated |
| Parking | Hand Lock to Foot Brake |
| CLUTCH | V-Belt System |
| STEERING | Enclosed Gear |
| WHEEL BEARINGS | |
| Front | Tapered Roller |
| Rear | Sealed Ball |

CURB WEIGHTS

| | 110 Tractor | 112 Tractor (Tecumseh) | 112 Tractor (Kohler) |
|---|-------------|------------------------|----------------------|
| Manual Lift—High Flotation Tires (GT-3) | 613 lbs. | 624 lbs. | 640 lbs. |
| Hydraulic Lift—High Flotation Tires (GT-3) | 625 lbs. | 636 lbs. | 660 lbs. |

NOTE: See specific sections for detailed specifications

TIRE SPECIFICATIONS AND TRACTOR DIMENSIONS




| | 110 Tractor Only | 110 and 112 Tractors | | |
|------------------------|-----------------------------|-----------------------------------|--------------------------|-----------------------------------|
| | All Purpose Tires (GT-1) | High-Flotation Tires (GT-3) | Traction Tires (GT-4) | High-Flotation Tires (GT-5) |
| WHEEL TREAD | | | | |
| Front | 29 in. | 30 in. | 29 in. | 30 in. |
| Rear | 27 or 33 in. | 27 or 33 in. | 27 or 33 in. | 28-1/2 or 31 in. |
| TIRE SIZES | | | | |
| Front | 4.80/4.00-8, 2-ply | 16x6.50-8, 2-ply | 4.80/4.00-8, 4-ply | 16x6.50-8, 2-ply |
| Rear | 6-12, 2-ply | 23x8.50-12, 2-ply | 23x8.50-12, 2-ply | 23x10.50-12, 2-ply |
| TIRE INFLATION* | | | | |
| Front | 12 to 30 psi | 6 to 16 psi | 12 to 40 psi | 6 to 16 psi |
| Rear | 6 to 12 psi | 5 to 10 psi | 5 to 10 psi | 5 to 10 psi |
| DIMENSIONS | | | | |
| Wheel Base | 46 in. | 46 in. | 46 in. | 46 in. |
| Over-all Length | 66-3/4 in. | 66-3/4 in. | 66-3/4 in. | 66-3/4 in. |
| Over-all Height | 41 in. | 41 in. | 41 in. | 41 in. |
| Over-all Width | | | | |
| (min) | 34-1/2 in. | 37 in. | 35 in. | 39 in. |
| (max) | 39 in. | 41-1/2 in. | 41-1/2 in. | 41-1/2 in. |
| Turns Outside | 36 in. radius | 34 in. radius | 34 in. radius | 33 in. radius |

* Inflation will vary with attachment used.

NOTE: GT-6 Tire Specifications are the same as GT-3 Front and GT-4 Rear Specifications.

GT-7 Tire Specifications are the same as GT-4 Front and GT-5 Rear Specifications

BOLT TORQUE CHART

| Grade of Bolt | | SAE-2 | SAE-5 | SAE-8 | Socket or Wrench Size | |
|-----------------------|------------------|---|---|--|-----------------------|--------|
| Min. Tensile Strength | | 64,000 PSI | 105,000 PSI | 150,000 PSI | | |
| Grade Marking on Bolt | |  |  |  | | |
| U.S. Standard | | TORQUE IN FOOT POUNDS | | | U.S. Regular | |
| Bolt Dia. | U.S. Dec. Equiv. | | | | 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 | Cup Point | Square Head |
|-----------------------|-----------|-------------|
| Torque in Inch Pounds | | |
| #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.

Group 15

TUNE-UP AND ADJUSTMENT

PRELIMINARY ENGINE TESTING

| Operation | Specification | Reference |
|----------------------|-----------------------------|------------------------------|
| Cylinder compression | 110-120 psi (1000 rpm) | Section 20, Group 5 or 25 |
| Crankcase vacuum | 5-10 inches of water column | Section 20, Group 5 or 25 |

MINOR TUNE-UP GUIDE

| Operation | Specification | Reference |
|--|--|-------------------------------|
| Change oil | Summer above 32° F.— SAE 30 (AM 30730) Winter below 32° F.— SAE 5W-20 (AM 30710) | Section 10, Group 20 |
| Clean and regap spark plug | Clean electrodes and insulator. Replace gasket Set spark gap at 0.025 in. 110 tractor; 0.030 in. 112 tractor w/Tecumseh engine; 0.020 in. 112 tractor w/Kohler engine | Section 40, Group 15 or 20 |
| Remove air cleaner, inspect and replace if dirty or clogged. | Air cleaner must be clean. (No air flow specifications avail- able.) | Section 30, Group 15 |
| Adjust carburetor | High speed mixture needle Idle mixture needle | Section 30, Group 10 |
| Adjust governor speed | Speed (fast)— 3800 rpm no load; Speed (idle)— 1200-1700 rpm | Section 20, Group 20 or 40 |
| Check and clean fuel tank and fuel shut off strainer. | Regular gasoline only | Section 30, Group 20 |
| Battery hydrometer test | 1.260-1.280 sp. gr. 100% charged at 80° F. | Section 40, Group 10 |

MAJOR TUNE-UP GUIDE

IMPORTANT: Major tune-up should include all items listed for "Minor Tune-Up" on page 15-1 in addition to the following:

| Operation | Specification | Reference |
|---|--|-------------------------------|
| Recondition carburetor | Install carburetor kit | Section 30, Group 10 |
| Inspect and clean breather assembly | Replace parts as necessary Install new gaskets. Check crankcase vacuum after assembly | Section 20, Group 10 Or 30 |
| Remove shrouding, clean engine and cylinder head fins | | Section 20, Group 10 or 30 |
| Test condenser | Capacity .18-.23 Microfarads Delco No. 1965489 Capacity .13-.16 Microfarads Phelon No. FG-7533 | Section 40, Group 15 or 20 |
| Test coil | K181 Kohler Engine Operating 3 amp Max. Ohms 3800 to 6000 K241AS Kohler Engine Operating .55 amp Max. Ohms 5500 to 9500 | Section 40, Group 15 or 20 |
| Replace breaker points | Point gap 0.020 in. | Section 40, Group 15 or 20 |
| Retime ignition | "SP" or "S" mark on fly-wheel at 1200-1800 rpm | Section 40, Group 15 or 20 |
| | 112 Tractor with Solid State Ignition | |
| Test charger coil | 400 to 450 Ohms | Section 40, Group 25 |
| Adjusting Ignition Air Gap | .006 to .010 in. | Section 40, Group 25 |

Group 20 FUEL AND LUBRICANTS

FUEL

Use regular grade gasoline of a recognized brand. Avoid using stale or long-storage gasoline. Stale gasoline does not vaporize properly, thus causing hard starts.

Use of premium grade gasoline (ethyl) is not recommended in small tractor engines. The engine compression ratio is not high enough to require premium grade, which can cause a buildup of lead deposits. These deposits cause a loss of power and shorten engine life.

Do not mix oil with gasoline. Do not use white gas.

LUBRICANTS

Illustrated lubrication instructions have been included in the operator's manual furnished with your customer's machine. Remind your customer to follow these recommendations.

Oil used in the engine crankcase should have an American Petroleum Institute (API)/SAE classification of Service MS. Never fill engine crankcase above full (F) mark on dipstick.

The charts below and on next page indicate the type of lubricant, capacities and service intervals recommended for 110 and 112 tractors.

CAPACITIES

| Cavities | 110 Tractors | 112 Tractors (Tecumseh) | 112 Tractors (Kohler) |
|------------------------------------|--------------|----------------------------|--------------------------|
| Fuel Tank - U.S. Gallons | 1.75 | 1.75 | 1.75 |
| Crankcase - U.S. Pints | * 2.5 | * 2.5 (†) | * 3.0 |
| Transaxle - U.S. Pints | 3.5 | 3.5 | 3.5 |
| Hydraulic Lift System - U.S. Pints | 2.5 | 2.5 | 2.0 |

* Initial fill for new engine or after engine has been disassembled for service. Thereafter 2 pints only (such as periodic oil changes).

†3 U.S. pints beginning with Serial No. 161,772.

**TYPE OF LUBRICANT
(110 and 112 Tractors)**

| | |
|---|---|
| Crankcase - (API)/SAE Service MS Detergent type | |
| Summer - Above 32° F | SAE 30 - John Deere AM30730 |
| Winter - Below 32° F | SAE 5W-20 John Deere AM30710 |
| Transaxle | John Deere AM30200M (SAE 90) |
| Hydraulic Lift | Automatic Transmission Fluid Type A |
| Tractor Grease Fittings and Front Wheel | |
| Bearings | SAE (Seasonal grade) Multipurpose-Type Grease |

**SERVICE INTERVALS
(110 and 112 Tractors)**

| | |
|--|----------------------------|
| Crankcase (Oil change) | |
| Break-in | First 2 hours |
| Regular | Every 25 hours |
| Dusty conditions | Every 8 hours |
| Transaxle (Oil change) | 200 hours or 2 years |
| Hydraulic Lift System | 200 hours or 2 years |
| Tractor Grease Fittings (See page 20-4 for locations) | |
| | Spring and fall season |
| Front Wheel Bearings (repack) | Each time wheel is removed |

CHANGING CRANKCASE OIL

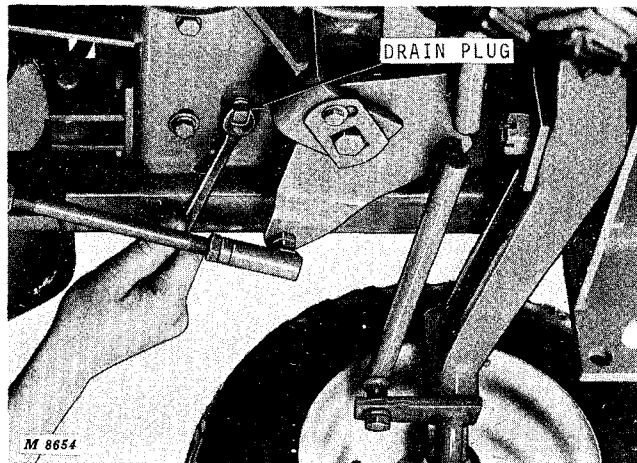


Fig. 1-Draining Oil (K181-HH100)

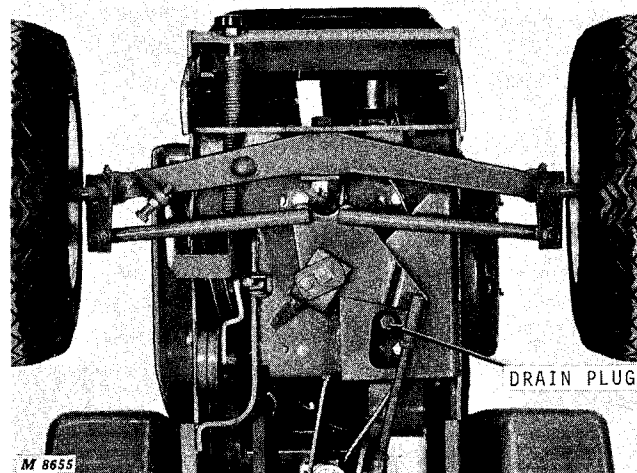


Fig. 2-Draining Oil (K241)

Drain crankcase when oil is hot and all dirt and foreign material is in suspension.

Remove drain plug and allow oil to drain into a container.

Install plug and fill crankcase with oil of the proper viscosity (page 20-2) to "F" mark on dipstick. Crankcase capacity is approximately 2-1/2 pints for 110 Tractors and 112 Tractors with Tecumseh engines. 112 Tractors with Kohler engines and 112 Tractors with Tecumseh engines, beginning with Serial No. 161,772, have a capacity of approximately 3 pints.

IMPORTANT: Check dipstick reading before pouring in the last 1/2 pint. Fill only to "F" mark. Overfilling can cause engine overheating resulting in permanent damage to the engine.

NOTE: Change oil every eight hours when working in extremely dusty conditions.

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CHANGING TRANSAXLE OIL

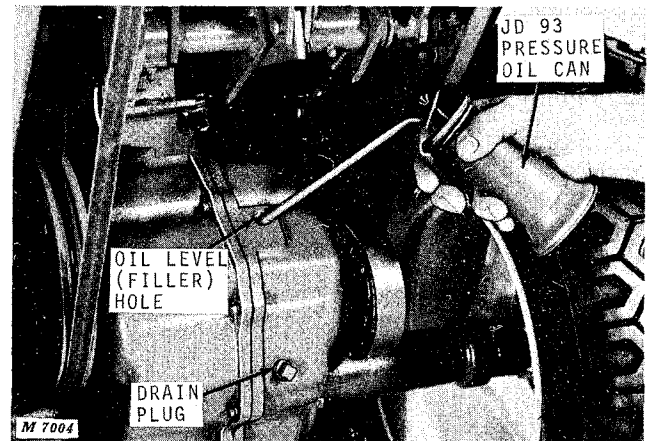


Fig. 3-Adding Oil to Transaxle

Remove oil level (filler) plug from front of transaxle.

When required, use a pressure oil can to add AM30200M Transmission Lubricant through filler hole until oil spills out. Be sure tractor is on a level surface when checking.

Use JD93 pressure oil can or equivalent to fill transaxle as shown above.

Change transmission oil every 200 hours.

NOTE: Refill or add transmission lubricant through fill tube at rear of deck if tractor is so equipped. Oil level (filler) hole must be open to assure correct lubricant level when filling.

GREASE FITTING LOCATION

Lubricate the grease fittings indicated below using a John Deere Pisto-Luber or hand grease gun containing SAE multipurpose-type grease. Wipe fittings clean before and after lubrication.

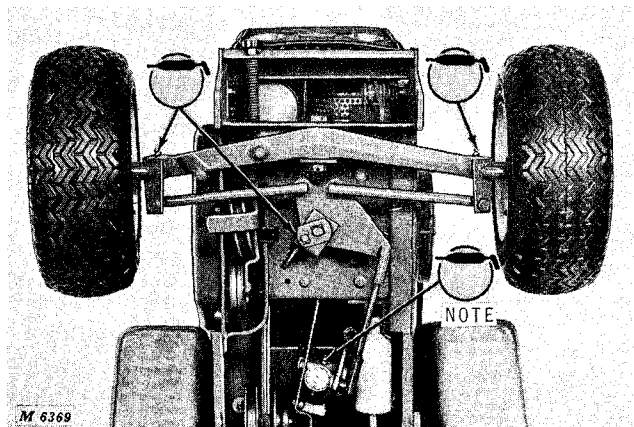


Fig. 4-Fittings on Front Axle, Steering Column and Bearing Cone

NOTE: Do not overlubricate steering column fitting. Only 3 or 4 strokes with hand grease gun or AM31300 Pisto-Luber are necessary. Do not use a high-pressure grease gun on this fitting. The Pisto-Luber is available from your John Deere dealer.

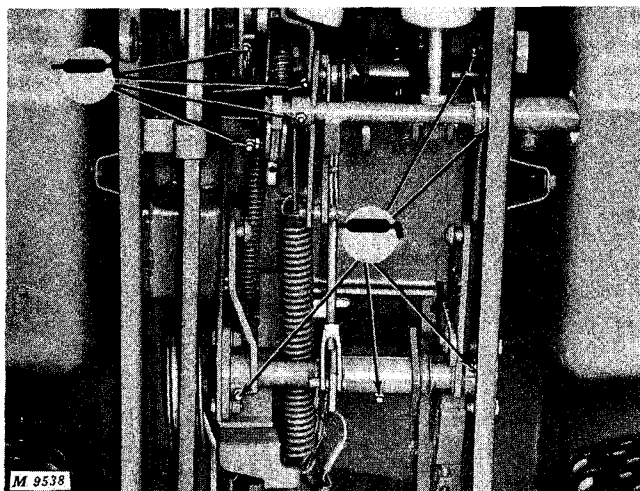


Fig. 5-Fittings on Variator Linkage, Lift Linkage and Rear Lift Shaft

REPACK POWER TAKE-OFF CLUTCH BEARING

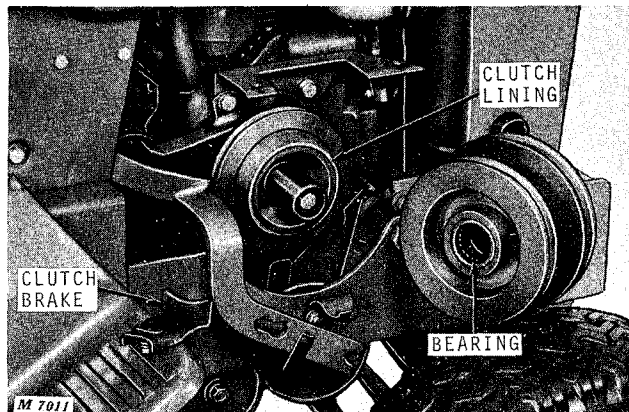


Fig. 6-Checking PTO Clutch

Disconnect the clutch arm and remove the clutch brake. Check PTO clutch to be certain that no dust or dirt has entered the bearing. Also check condition of clutch lining and clutch brake.

Remove old grease from bearing with solvent at the beginning of each spring and fall season or sooner if dirt is found in the bearing. Dry thoroughly and repack bearing with John Deere High Temperature Grease, AT17659T, available in one-pound cans. Connect the clutch arm and reinstall the clutch brake. Adjust the clutch brake so there is 1/16-inch clearance between the brake and clutch cup sheave when the clutch is engaged.

See Section 50, Group 20, for PTO clutch service information.

Section 20 ENGINE

Group 5 GENERAL INFORMATION KOHLER ENGINES FOR 110 AND 112 TRACTORS

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DESCRIPTION

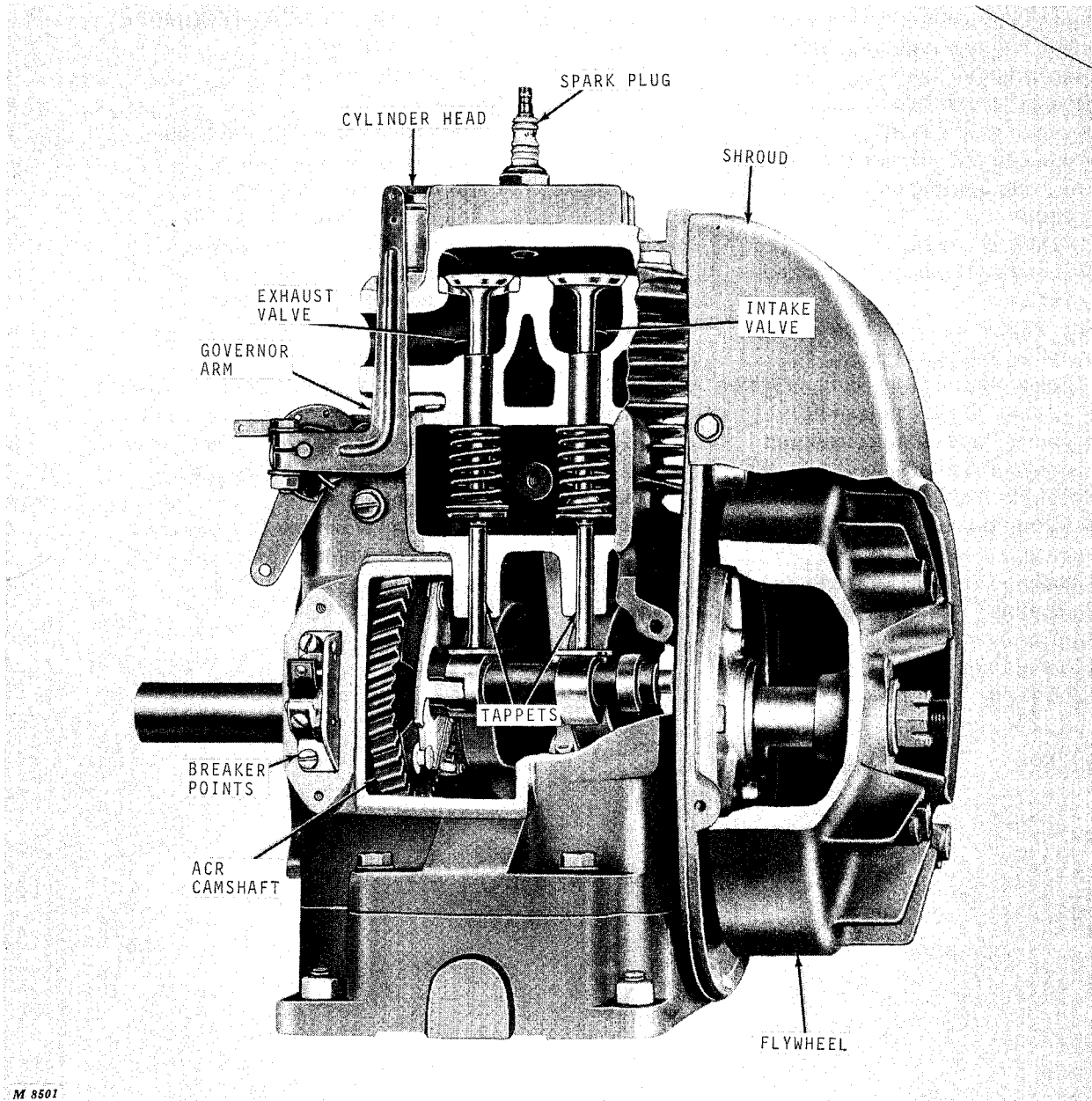


Fig. 1-Cutaway View of Kohler K181S Engine Showing Valves and Tappets

The Kohler K181S Engine powers the 110 Tractor; the Kohler K241AS Engine is optional power for the 112 Tractor. These engines are of a single-cylinder, four-cycle, air-cooled design.

Both engines have cast iron blocks, anti-friction ball bearings, oil bath lubrication, and internal fly-weight governors.

In addition, the Kohler K241AS Engine features a dynamic balance system which consists of two balance gears rotated by the crankshaft in the opposite direction of crankshaft rotation.

Detailed specifications for each engine are covered in Section 10, "General," and at the end of each group in this section.