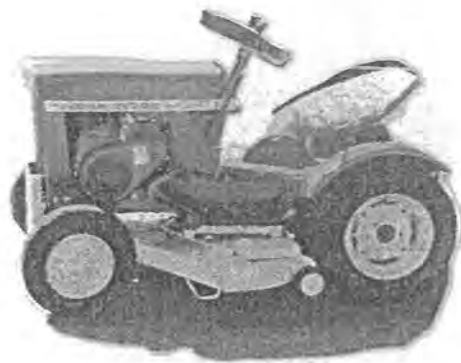


JOHN DEERE

110 AND 112 LAWN AND GARDEN TRACTOR

SERVICE MANUAL



K 161S & K 181S Engines

ROUND FENDER

Service Manual

110 AND 112 LAWN AND GARDEN TRACTORS

(Serial No. -100,000)

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INTRODUCTION

This service manual contains service and maintenance information for John Deere 110 and 112 Lawn and Garden Tractors (Serial No. -100,000).

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.

All sections of this service manual should be carefully studied by the serviceman. Much basic information such as the principles of 4-cycle engine operation, carburetion and ignition have been omitted. Such information can be found in any good library and is recommended reading for the new serviceman before consulting this manual for service procedures.

Emphasis is placed on diagnosing malfunctions, analysis and testing. Diagnosing mal-

functions lists possible troubles, their causes and how to correct them. Under specific components these troubles are analyzed to help the serviceman understand what is causing the problem so he can correct it 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 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 always will be up-to-date and be a valuable asset in your service department.

TNEWCAMP MANUALS

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. Only the last four digits

of the serial number are shown for earlier tractors and the last six digits for later tractors. All serial number references are tractor serial numbers and not engine specification numbers.

- (3551-) When a serial number appears before the dash, the design change was introduced beginning with that serial number and is still current.
- (-40000) 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.
- (40001-65000) 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.

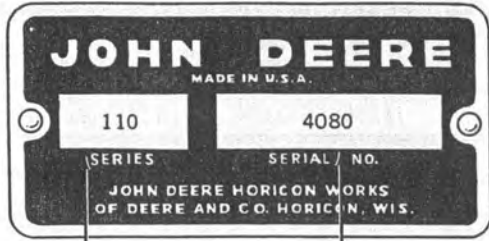
VINTAGE INFORMATION

	110 Tractor					112 Tractor
	(-3550)	(3551-15000)	(15001-40000)	(40001-65000)	(65001-100,000)	(-100,000)
Year Manufactured	1963	1964	1965	1966	1967	1966-1967
Model - Manual Lift	110	110	110	110	110	112
Model - Hydraulic Lift	---	---	---	110H	110H	112H
Engine Model Number	Kohler K161S	Kohler K181S	Kohler K181S	Kohler K181S	Kohler K181S	Tecumseh HH100
Engine Horsepower	7	8	8	8	8	10
Transaxle Speeds (Forward)	3	3	4	4	4	4
Transaxle Speeds (Reverse)	1	1	1	1	1	1

SERIAL NUMBER PLATES

SERIAL NO. (-15000)

SERIAL NO. (15001-40000)

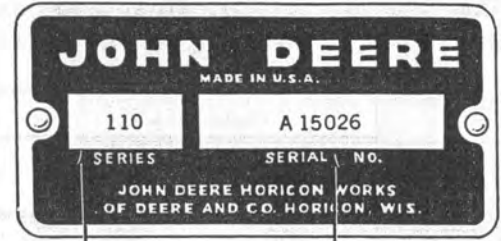


Model Identification

4 or 5 - Digit Tractor Serial Number

M 5556

Fig. 1



Model Identification

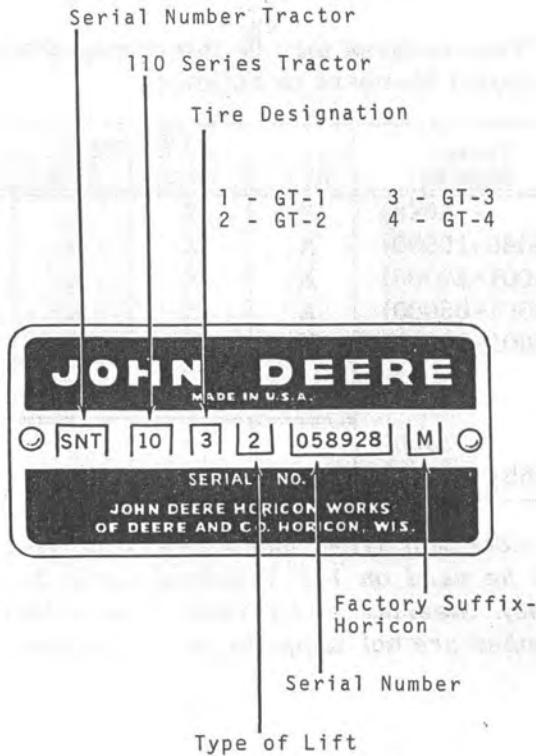
5-Digit Tractor Serial Number with "A" Prefix

M 5554

Fig. 3

SERIAL NO. (40001-65000)

SERIAL NO. (65001-100,000)

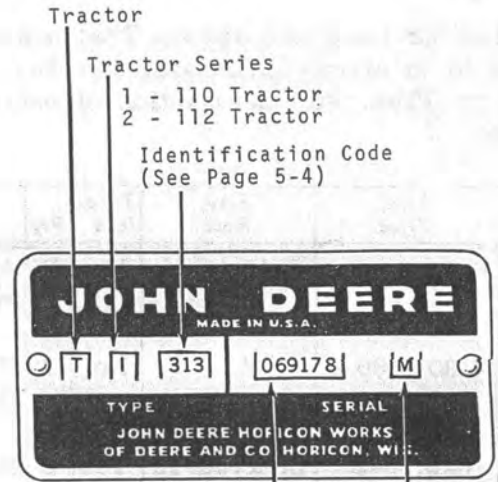


Type of Lift

- 1. Manual Lift
- 2. Hydraulic Lift

M 5553

Fig. 2



Serial Number

Factory Suffix-Horicon

M 5555

Fig. 4

IDENTIFICATION CODES

TRACTOR CODES

The tractor identification code is indicated on tractor serial number plates beginning with tractor Serial No. 65001. See the chart below for tractor identification codes.

Tire	110 Manual Lift		110 Hydraulic Lift		112 Manual Lift	112 Hydraulic Lift
	Without Mower Drive	With Mower Drive	Without Mower Drive	With Mower Drive	Without Mower Drive	Without Mower Drive
GT-1	300	304	307	311	---	---
GT-2	301	305	308	312	---	---
GT-3	302	306	309	313*	314	316
GT-4	303	---	310	---	315	317

**Example: Code 313 is a 110 Tractor with hydraulic lift, factory installed mower drive and GT-3 high-flotation tires.*

TIRE CODES

Tires for Lawn and Garden Tractors are referred to in abbreviated form as GT-1, GT-2, GT-3 or GT-4. The description of each is as follows:

Tire	Size, Front	Size, Rear	Tubeless	Ply	Tread
GT-1	4.80/4.00-8	6-12	No	2	All Purpose
GT-2	4.80/4.00-8	6-12	No	2	Trac-tion
GT-3	16x6.50-8	23x8.50-12	Yes	2	High-Flota-tion
GT-4	4.80/4.00-8	---	No	4	Studded
GT-4	---	23x8.50-12	Yes	2	Trac-tion

TIRE INTERCHANGEABILITY

Tractor tires may be interchanged depending on Serial Numbers as follows:

Tractor Serial No.	110 Tractors			
	GT-1	GT-2	GT-3	GT-4
(- 4048)	X	X	--	--
(4049-15000)	X	X	X	--
(15001-40000)	X	X	X	--
(40001-65000)	X	X	X	X
(65001-100,000)	X	X	X	X
	112 Tractors			
(- 3550)	--	--	X	X
(3551-)	--	--	X	X

Note that GT-3 and GT-4 front tires should not be used on 110 Tractors Serial No. (- 4048). Steering gear ratios below this serial number are not adequate for these tires.

Group 10 SPECIFICATIONS

ENGINE SPECIFICATIONS

Engines	110 Tractors		112 Tractors
	(-3550)	(3551-)	(-100 000)
Engine Model No.	K161S	K181S	HH100
Manufacturer	Kohler	Kohler	Tecumseh
Cylinders	One	One	One
Cycle	Four	Four	Four
Bore & Stroke	2.875 x 2.50 in.	2.94 x 2.75 in.	3.31 x 2.75 in.
Displacement	16.22 cu. in.	18.63 cu. in.	23.70 cu. in.
Speeds (fast) No Load	1800-3800 rpm	1800-3800 rpm	1800-3800 rpm
Speeds (idle)	1200-1700 rpm	1200-1700 rpm	1200-1700 rpm
Horsepower (Engine Manufacturers Rating)*	7 @ 3600 rpm*	8 @ 3600 rpm*	10 @ 3600 rpm*
Normal Compression	110-120 psi	110-120 psi	110-120 psi
Valve Clearance	---	---	---
(Intake) Cold	0.007 in.	0.007 in.	0.010 in.
Valve Clearance	---	---	---
(Exhaust) Cold	0.016 in.	0.016 in.	0.010 in.

**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 29.92 in. Hg. Barometer and are developed from laboratory test engines equipped with standard air cleaner and muffler less motor-generator equipment.*

CAPACITIES

Cavities	110 Tractors			112 Tractors
	(-15000)	(15001-40000)	(40001-100,000)	(-100,000)
Fuel Tank - U.S. Gallons	1.9	1.9	1.9	1.9
Crankcase - U.S. Pints	2.5	2.5	2.5	2.5
Transaxle - U.S. Pints	2.0	3.0	3.0	3.0
Hydraulic Lift System - U.S. Pints	--	--	2.5	2.5

VARIABLE GROUND SPEEDS - MILES PER HOUR
(at 3600 rpm engine speed)

	110 Tractor				112 Tractor
	(-3550)	(3551-15000)	(15001-65000)	(65001-100,000)	(-100,000)
1st Gear	.9 to 2.5	1.1 to 2.5	.37 to .84	.4 to .8	.4 to 1.0
2nd Gear	1.6 to 4.5	2.1 to 4.4	1.1 to 2.5	1.1 to 2.5	1.3 to 2.9
3rd Gear	2.4 to 6.5	3.0 to 6.5	2.1 to 4.4	2.1 to 4.4	2.4 to 5.0
4th Gear	---	---	3.0 to 6.5	3.0 to 6.5	3.4 to 7.4
Reverse	1.2 to 3.4	1.5 to 3.4	1.6 to 2.9	1.6 to 2.9	1.8 to 3.3

CURB WEIGHTS

Tire Groups	110 Tractor				112 Tractor
	(-3550)	(3551-15000)	(15001-40000)	(40001-100,000)	(-100,000)
GT-1 Manual Lift	500 lbs.	513 lbs.	531 lbs.	545 lbs.	---
GT-2 Manual Lift	500 lbs.	513 lbs.	531 lbs.	545 lbs.	---
GT-3 Manual Lift	---	*535 lbs.	550 lbs.	568 lbs.	579 lbs.
GT-4 Manual Lift	---	---	---	570 lbs.	581 lbs.
GT-1 Hydraulic Lift	---	---	---	566 lbs.	---
GT-2 Hydraulic Lift	---	---	---	566 lbs.	---
GT-3 Hydraulic Lift	---	---	---	583 lbs.	591 lbs.
GT-4 Hydraulic Lift	---	---	---	586 lbs.	594 lbs.

**Weight becomes effective with Serial No. 4049.*

TNEWCAMP MANUALS

TRACTOR SPECIFICATIONS

	110 Tractor Only	110 and 112 Tractors	
	All Purpose and Traction Tires (GT-1 & 2)	High-Flotation Tires (GT-3)	High-Flotation Traction Tires (GT-4)
WHEEL TREAD			
Front	29 in.	30 in.	30 in.
Rear	27 or 33 in.	27 or 33 in.	27 or 33 in.
TIRE SIZES (Also see Group 5)			
Front	4.80/4.00-8 2 ply	16 x 6.50-8 2 ply	4.80/4.00-8 4 ply
Rear	6-12 2 ply	23 x 8.50-12 2 ply	23 x 8.50-12 2 ply
TIRE INFLATION*			
Front	12 psi	6 to 16 psi	12 to 40 psi
Rear	6 psi	5 to 10 psi	5 to 10 psi
DIMENSIONS			
Wheel Base	44 in.	44 in.	44 in.
Over-all Length	63 in.	63 in.	63 in.
Over-all Height	38-3/4 in.	38-3/4 in.	38-3/4 in.
Over-all Width:			
(min.)	34-1/2 in.	37 in.	37 in.
(max.)	39 in.	41-1/2 in.	41-1/2 in.
Turns Outside	30-1/2 in. radius	28-1/2 in. radius	28-1/2 in.

**Use high psi readings for heavy front end loads such as when the tractor is equipped with a loader. Use mid-range readings when the tractor is equipped with a blade or snow thrower. Use low readings for normal lawn use.*

TRANSAXLE - See Section 50 for detailed specifications.




ELECTRICAL SYSTEM - See Section 40 for detailed specifications.

FUEL SYSTEM - See Section 30 for detailed specifications.

CLUTCH, BRAKE AND VARIATOR - See Section 50 for detailed specifications.

STEERING AND WHEEL BEARINGS - See Section 70 for detailed specifications.

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		<p style="text-align: center;">TORQUE IN FOOT POUNDS</p>			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

IMPORTANT: Before attempting to tune-up the 110 or 112 Tractor engine, first determine if performance can be restored by tune-up. Do this by making the preliminary engine tests below.

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
Battery hydrometer test	1.260-1.280 sp. gr. 100% charged at 80° F.	Section 40, Group 10

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 Clean insulation Replace gasket Set gap at 0.025 in.—Kohler Set gap at 0.030 in.—Tecumseh	Section 40, Group 10
Remove air cleaner and clean by tapping lightly against flat surface	Check air cleaner condition Replace if necessary	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, sediment bowl and strainer	Regular gasoline only	Section 30, Group 20

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	Section 40, Group 10
Test coil	Operating amp. 2.25 max. Secondary continuity Min. 3.9 OHMS, Max. 4.08 OHMS, Delco No. 1115043	Section 40, Group 10
Replace breaker points	Point gap 0.020 in.	Section 40, Group 10
Retime ignition	"SP" or "S" mark on fly-wheel at 1200-1800 rpm	Section 40, Group 10

COMMON ADJUSTMENTS

NOTE: The following common adjustments are recommended after engine tune-up is completed:

Adjustment	Specification	Reference
Clutch, brake and variable speed	Section 50, Group 10
Steering linkage	Section 70, Group 5
Belt tension:		
Motor-Generator	Section 40, Group 15
Hydraulic Pump	Section 60, Group 15
Primary	Section 50, Group 10
Secondary	Section 50, Group 10

Group 20 FUEL AND LUBRICANTS

FUEL

Use regular grade gasoline only of recognized brand. It should be fresh and from a supply blended for the area in which it is to be used. Summer blends held over for winter use will not vaporize properly at lower temperatures and may be the real reason for slow starts. White gas may be used only if octane rating is at least 75.

Do not mix oil with gasoline.

Never use premium grade gasoline (ethyl) in small tractor engines. The compression ratio (6.5 to 1) is not high enough to require the premium grade and it can cause a severe buildup of lead deposits in the engine. The deposits will rob power and may shorten the life of the engine.

LUBRICANTS

Carefully written and illustrated instructions have been included in the operator's manual furnished with your customer's machine. Remind your customer to follow the recommendations in those instructions.

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 chart below and on page 20-2 indicates type of lubricant, capacities and service intervals recommended for both 110 and 112 tractors.

CAPACITIES

Cavities	110 Tractor	112 Tractor
Fuel Tank - U.S. Gallons	1.9	1.9
Crankcase - U.S. Pints	*2.5	*2.5
Transaxle - U.S. Pints	2.0 (-15000)	3.0
Transaxle - U.S. Pints	3.0 (15001-)	3.0
Hydraulic Lift System - U.S. Pints	2.5 (1 to 1-1/2 inches below top of reservoir)	2.5 (1 to 1-1/2 inches below top of reservoir)

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

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
Hydraulic Lift.	Automatic Transmission Fluid Type A
Tractor Grease Fittings and Front Wheel Bearings	
	SAE Multi-Purpose 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

TNEWCAMP MANUALS

CHANGING CRANKCASE OIL

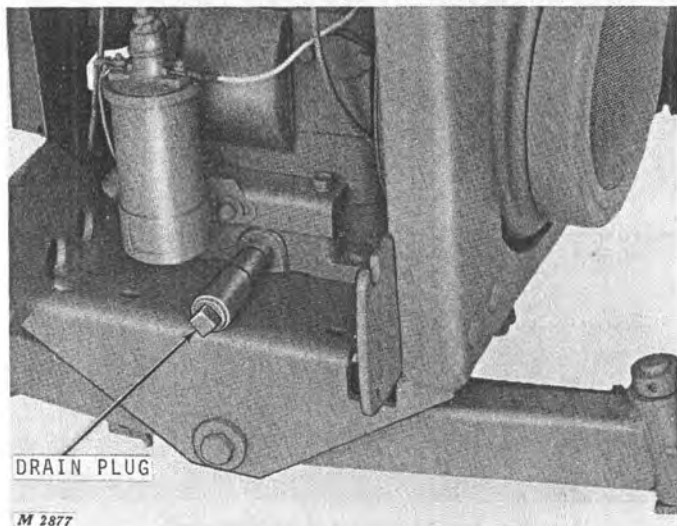


Fig. 1 - Oil Drain on 110 Tractors (-15000)

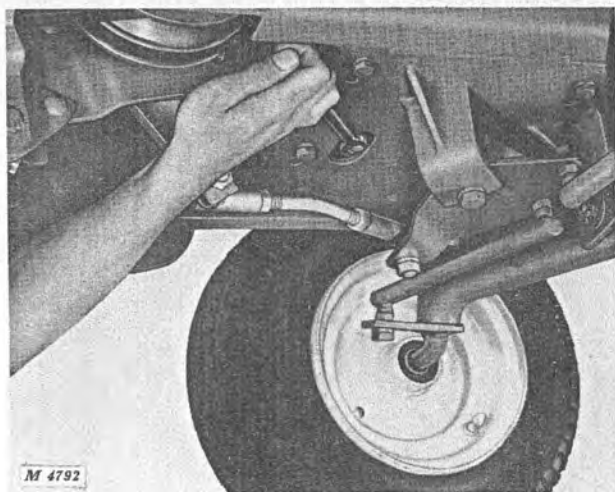


Fig. 2 - Oil Drain on 110 Tractors (15001-100,000)
and 112 Tractors (-100,000)

Before draining oil, allow engine to warm up. Dirt and foreign material is in suspension when oil is hot.

CHANGING TRANSAXLE OIL

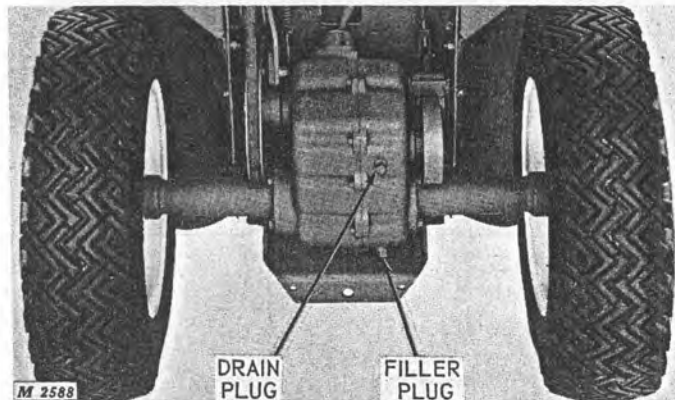


Fig. 3 - Filling Transaxle on 110 Tractors (-3550)

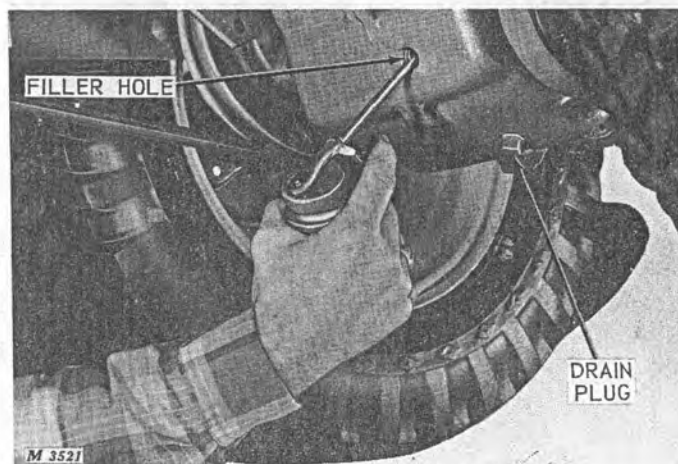


Fig. 4 - Filling Transaxle on 110 Tractors
(3551-100,000) and 112 Tractors (-100,000)

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

GREASE FITTING LOCATION

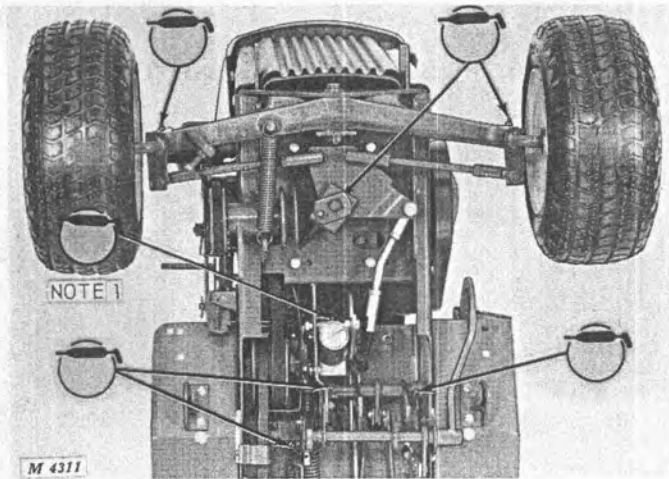


Fig. 5 - Tractor Grease Fittings

110 Tractors Serial No. 40001 and higher and 112 Tractors have grease fittings as indicated above. 110 Tractors Serial No. 40000 and below do not have all grease fittings indicated above.

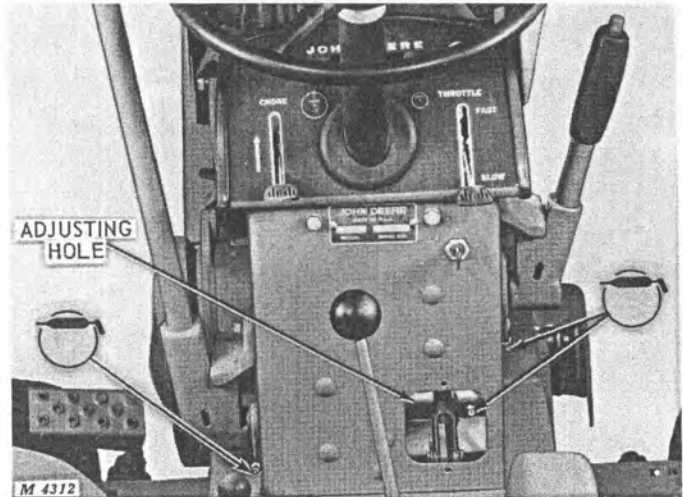


Fig. 6 - Inspection Plate Removed to Expose Grease Fitting

NOTE: Do not overlubricate steering column fitting. Only 3 or 4 strokes with hand grease gun or 15 to 20 strokes with JD5804 Lubrigun are necessary. Do not use high pressure grease guns on this fitting.

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Section 20 ENGINE

Group 5 GENERAL INFORMATION

KOHLER ENGINE FOR 110 TRACTOR

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TNEWCAMP MANUALS

DESCRIPTION

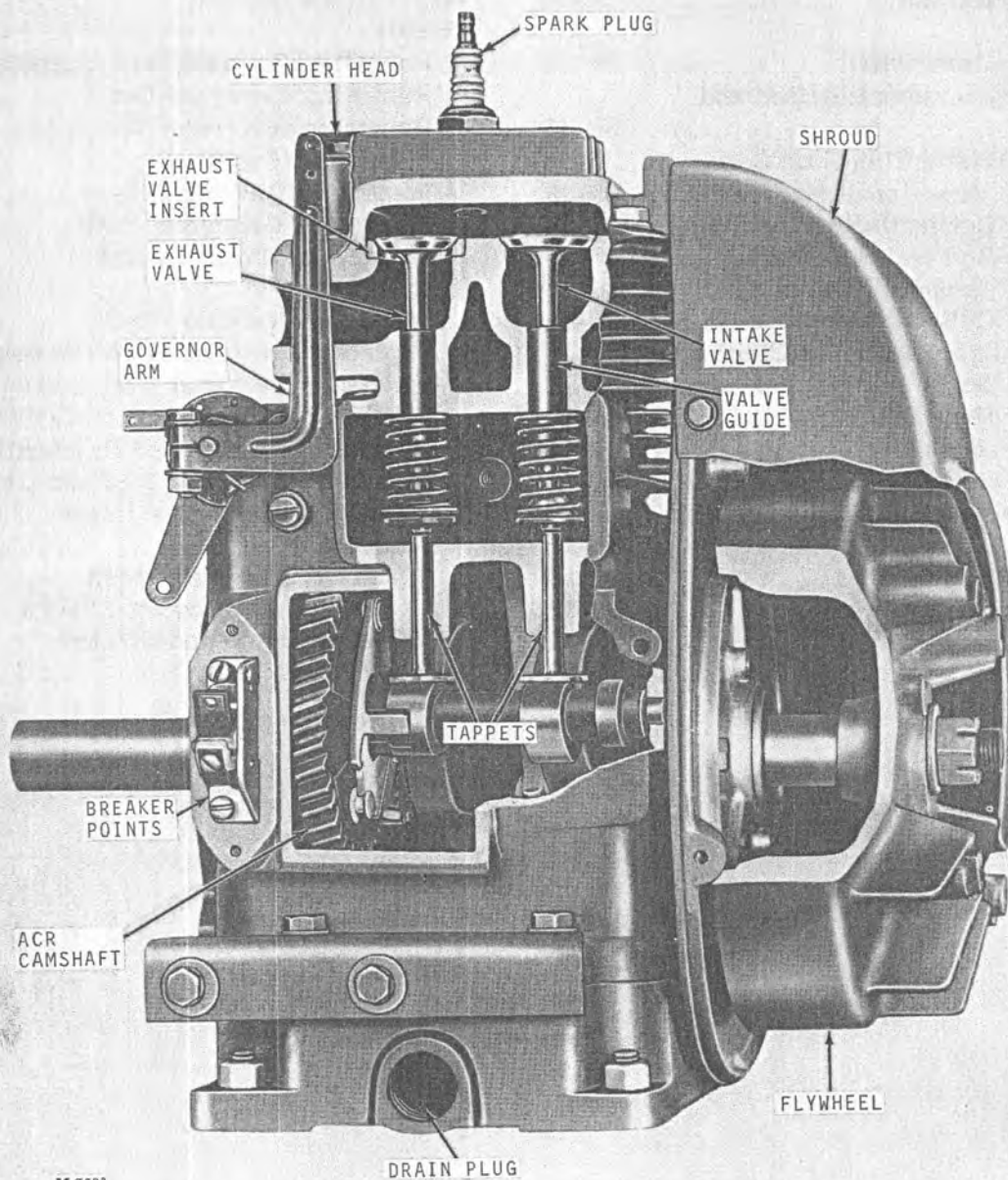


Fig. 1-Cutaway View of Kohler K181S Engine Showing Valves and Tappets

Both K161S and K181S engines used in 110 Tractors are Kohler four cycle, internal combustion engines. They have cast iron blocks, and are L-head, single cylinder with large bore - short stroke design.

Both engines are air cooled with anti-friction ball bearings, oil bath lubrication and have internal flyweight governor.

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

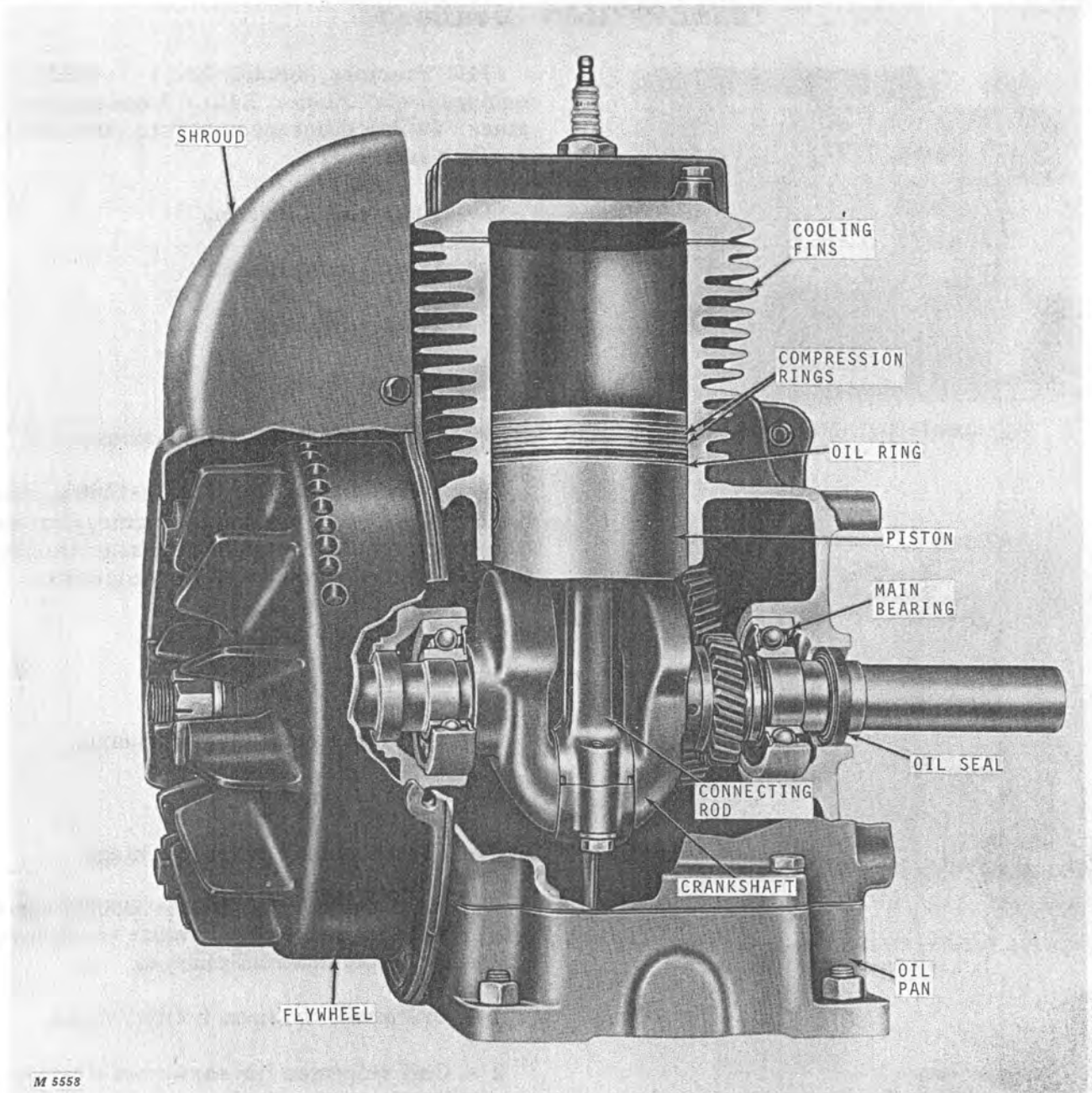


Fig. 2-Cutaway View of Kohler K181S Engine Showing Piston, Crankshaft and Bearings

The maximum brake horsepower curve shows the performance of laboratory engines equipped with standard air cleaner, muffler and flywheel corrected to sea level barometer and with free air temperature of 60° F. Horsepower decreases 3-1/2% for each 1000 feet above sea level, and 1% for each 10° F. above 60° F.

Horsepower ratings are established in accordance with Society of Automotive Engineers - Small Engine Test Code - J 607.

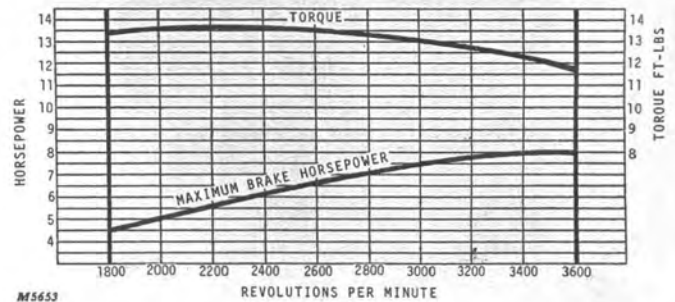


Fig. 3-Torque-Horsepower Chart

DESCRIPTION—Continued

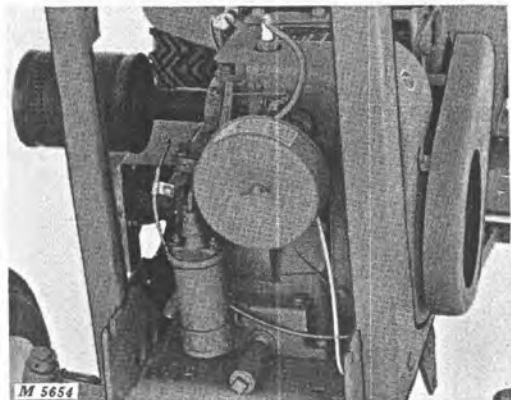


Fig. 4—Kohler K161S 7 Horsepower Engine
Serial No. (-3550)

110 Tractors, Serial No. (- 3550), are equipped with Kohler K161S 7 Horsepower engines. Visible differences between this and later engines are:

- 1 - Air cleaner location.
- 2 - Screw-type dipstick.
- 3 - Blower housing.
- 4 - Muffler design.
- 5 - Engine identification markings.

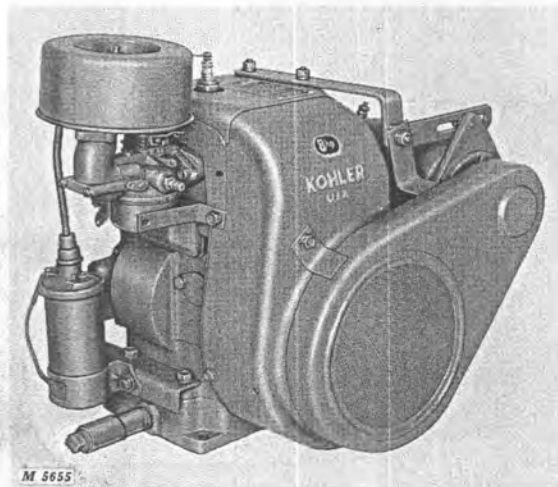


Fig. 5—Kohler K181S 8 Horsepower Engine
Serial No. (3551-15000)

Tractors, Serial No. (3551-15000), used Kohler K181S 8 Horsepower engines. In addition to mechanical changes necessary to obtain the extra horsepower, visible changes are:

- 1 - Air cleaner position.
- 2 - Push-type dipstick.
- 3 - Extra screen in blower housing.
- 4 - Improved muffler.
- 5 - Engine identification markings.

Tractors, Serial No. (15001-100000) use the Kohler K181S 8 Horsepower engine which has the following visible external changes:

- 1 - Crankcase drain on bottom of pan.
- 2 - Coil relocated for easier point access.

Internal changes on engines for tractors, Serial No. (40001-100000), include:

- 1 - Automatic compression release camshaft (ACR).
- 2 - Exhaust valve rotators for tractors equipped with hydraulic lift.
- 3 - Studs are provided in the engine head to carry the hydraulic pump and valve on 110H Tractors.



Fig. 6—Kohler K181S 8 Horsepower Engine
Serial No. (15001-100000)

**Thank you very much
for your reading.**

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**Then Get More
Information.**