

F910/F930 Front Mower



TECHNICAL MANUAL

F910/F930
Front Mower

TM1301 (01APR86) English

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ENGLISH



F910/F930 FRONT MOWER TECHNICAL MANUAL TM-1301 (Apr-86)

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All information, illustrations and specifications contained in this technical 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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Section 10

GENERAL INFORMATION

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INTRODUCTION

This manual is part of a total service support program.

FOS Manuals—reference

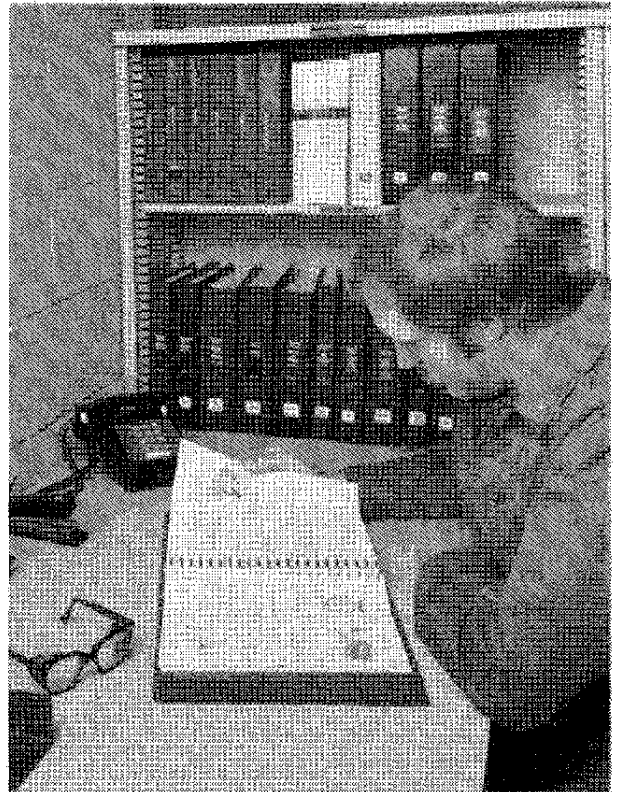
Technical Manuals—machine service

Component Manuals—component service

Fundamentals of Service (FOS) Manuals cover basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic types of failures and their causes. FOS Manuals are for training new personnel and for reference by experienced technicians.

Technical Manuals are concise service guides for specific machines. Technical manuals are on-the-job guides containing only the vital information needed by an experienced service technician.

Component Technical Manuals are concise service guides for specific components. Component technical manuals are written as stand alone manuals covering multiple machine applications.



AB6;RW5559 053;INTRO2 030785

FEATURES OF THIS TECHNICAL MANUAL

John Deere ILLUSTRATION format emphasizing illustrations and concise instructions in easy-to-use modules.

Emphasis on diagnosis, analysis, and testing so you can understand the problem and correct it.

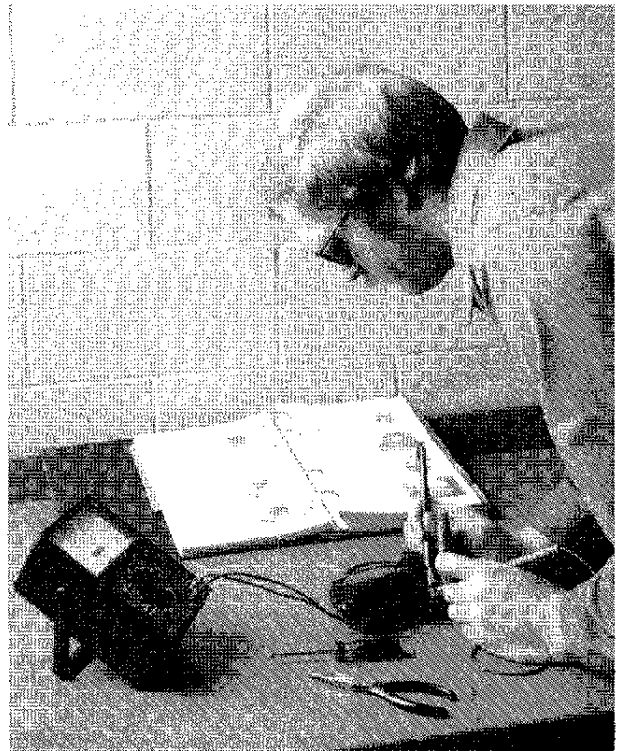
Diagnostic information presented with the most logical and easiest to isolate problems first to help you identify the majority of routine failures quickly.

Step-by-step instructions for teardown and assembly.

Summary listing at the beginning of each group of all applicable specifications, wear tolerances, torque values, essential tools, and materials needed to do the job.

An emphasis throughout on safety—so you do the job right without getting hurt.

This technical manual was planned and written for you—an experienced service technician. Keep it in a permanent binder in the shop where it is handy. Refer to it when you need to know correct service procedures or specifications.



AB6;RW5560 053;INTRO3 071085

SAFETY AND YOU



CAUTION: This safety symbol is used for important safety messages. When you see this symbol, follow the safety message to avoid personal injury.



4A9;T81389 M45;;1005A 3 090185

AVOID FIRE HAZARDS

Be prepared if an accident or fire should occur. Know where the first aid kit and the fire extinguishers are located—know how to use them.

Do not smoke while you fill the fuel tank, service fuel system or handle highly flammable material.

Do not remove fuel cap or add fuel to tank when engine is hot or running. Allow engine to cool for several minutes.

Do not use open pans of gasoline or diesel fuel for cleaning parts. Use good commercial, nonflammable solvents.

Provide adequate ventilation when charging batteries.

Do not check battery charge by placing metal objects across the posts.

Do not allow sparks or open flame near batteries.

Do not smoke near battery.

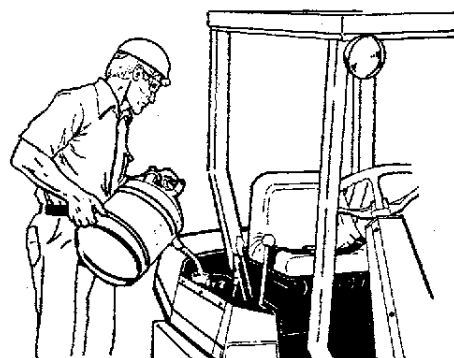
Never check fuel or battery electrolyte with an open flame.

Never use an open flame to look for leaks anywhere on the equipment.

Never use an open flame as light anywhere on or around the equipment.

When preparing engine for storage, remember that inhibitor is volatile and therefore dangerous. Seal and tape openings after adding the inhibitor. Keep container tightly closed when not in use.

Inspect electrical wiring for worn or frayed insulation. Install new wiring if wires are damaged.

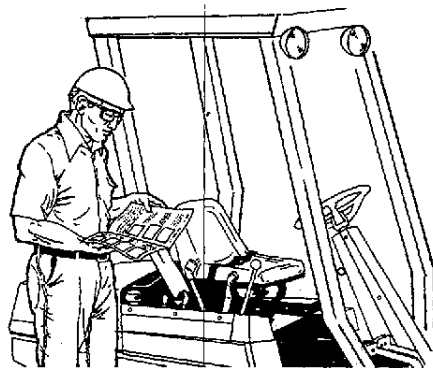


4A9;M34554 M45;;1005A 4 090184

UNDERSTAND MACHINE OPERATION

Only qualified people should operate the machine.

Carefully read this manual and manuals furnished with attachments. Learn the location and purpose of all controls, instruments, indicators, and labels.



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WEAR PROTECTIVE CLOTHING

Wear fairly tight clothing and safety equipment.

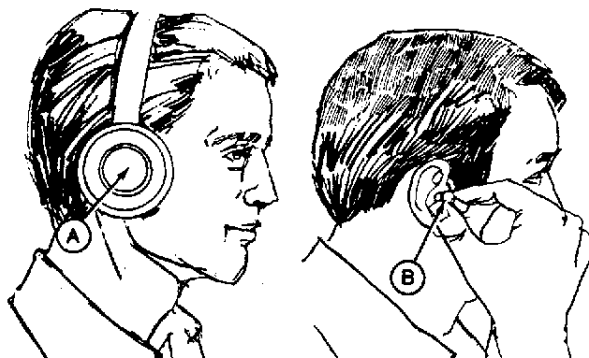


4A9;M34583 M45;;1005A 6 090185

PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs (A) or earplugs (B) to protect against objectionable uncomfortable loud noises.

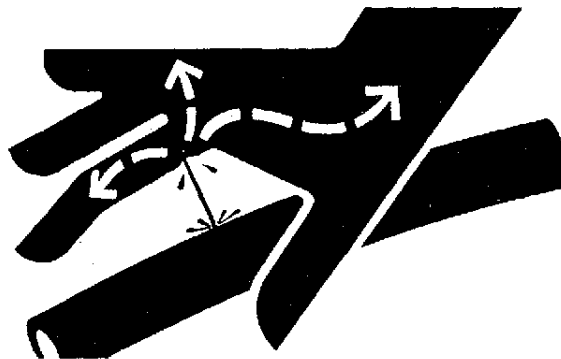


AB6;X7662 053;NOISE 150584

AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.



AB6;X9811 053;FLUID 100584

START ENGINE SAFELY

Avoid possible injury or death from machine runaway.

Do not start engine by shorting across starter terminals.

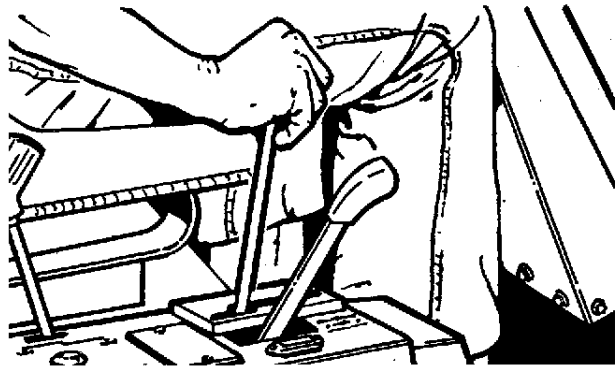
Before you start the engine:

- Sit on the operators seat.

- Move hydrostatic control lever to "STOP" position.

- Engage the park brake.

- Lower equipment to the ground.



4A9;M33722 M45;1005A 7 090185

OPERATE MACHINE SAFELY

Before you move any equipment, be sure all persons are away from the machine.

When the machine is operating, **ONLY** the operator should be on it.

Keep operating area level.



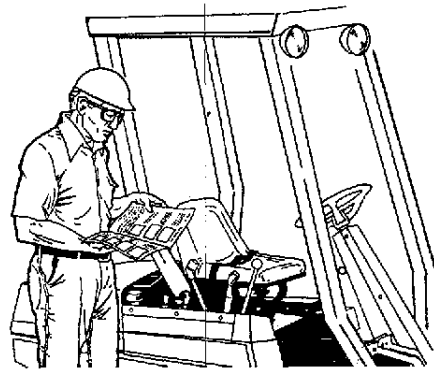
4A9;M34557 M45;1005A 8 090185

UNDERSTAND CORRECT SERVICE

Be sure you understand a service procedure before you work on the machine.

Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If it is necessary to make checks with the engine running, **ALWAYS USE TWO PEOPLE**—with the operator at the controls, able to see the person doing the checking.



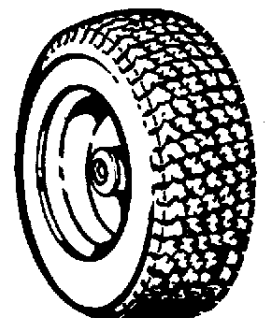
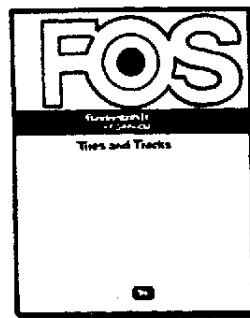
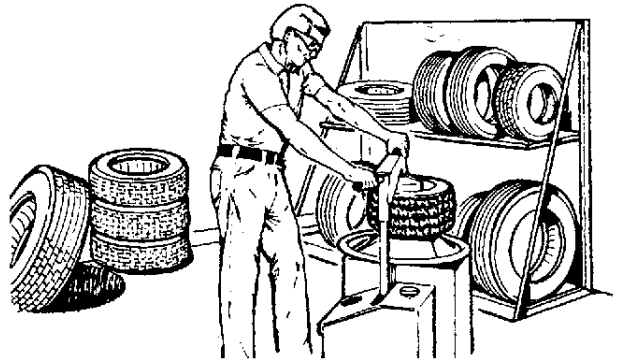
4A9;M34552 M45;1005A 9 130385

SERVICE TIRES SAFELY

Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death. Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. Have it done by your John Deere dealer or a qualified tire repair service.

When sealing tire beads on rims, never exceed 35 psi (241 kPa) (2.4 bar) or maximum inflation pressures specified by tire manufacturers for mounting tires. Inflation beyond this maximum pressure may break the bead, or even the rim, with dangerous explosive force. If both beads are not seated when the maximum recommended pressure is reached, deflate, reposition tire, relubricate bead and reinflate.

Detailed tire mounting instructions, including necessary safety precautions, are contained in John Deere Fundamentals of Service (FOS) Manual 55, Tires and Tracks, available through your John Deere dealer. Such information is also available from the Rubber Manufacturers Association and from tire manufacturers.

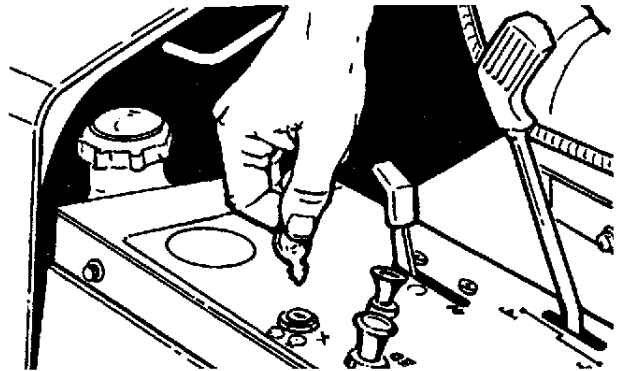


AB6/M34163, M34164 053;TIRE4 091283

PREPARE MACHINE FOR REPAIR

1. Move hydrostatic control lever to "STOP" position.
2. Disengage PTO's
3. Lower all equipment to the ground.
4. Engage park brake.
5. Stop the engine.
6. Remove key.
7. Operate all hydraulic control levers to release hydraulic pressure in the system.

Before you leave the operator's seat, wait for engine and attachment parts to stop moving.



4A9/M33731 M45;1005A 10 130385

F930 FRONT MOWER SPECIFICATIONS**Engine**

Manufacturer	ONAN
Engine Model Number	T260
Cylinder	Two
Cycle	Four
Bore	90.42 mm (3.56 in.)
Stroke	76.20 mm (3.00 in.)
Displacement	983 cm ³ (60 cu. in.)
Horsepower*	17.9 KW (24 hp)
Speeds	
Idle	1300 rpm
High (no load)	3450 ±100 rpm

**Horsepower rating is established by engine manufacturer in accordance with Standard International Combustion Institute procedure. It is corrected to (16° C) and 29.92 hg barometer. Laboratory test engines are equipped with air cleaner and muffler.*

Electrical System

Battery, John Deere (AM100241)	Category II, 12-Volt, BCI Group 22 FC, 491 cold cranking amps at 17.7° C (0° F), 102 minute reserve capacity
Alternator Charging Capacity	20 amps
System Polarity	Negative Ground
Starter	12-Volt motor, Key and Solenoid
Ignition	Battery-Coil
Spark Plug **	Champion RBN13Y NGK -BPR5EFS NGK -BPR6EFS Autolite/Motorcraft —AGRF32 or equivalent
Spark Plug Gap	0.64 mm (0.025 in.)
Breaker Point Gap	0.41 mm (0.016 in.)
Timing	Index

***In Canada, compliance with radio interference regulations certified. Replace spark plug with resistor type spark plug only.*

Power Train

Hydrostatic Transmission	Sundstrand 15 Series (U-Type)
Differential	Peerless Single-Speed (with Differential Lock)
Brakes	Individual Front Wheel (Drum-Type)

Travel Speeds

Forward	Variable 0 to 16.2 Km/hr. (0 to 10.1 mph)
Reverse	Variable 0 to 8 Km/hr. (0 to 5.3 mph)

Hydraulics	Control Valve . 2-Spool (open-center)
Outlets	1 Set (front)
Lift Cylinders	Front-mounted

Tire Size

Front	23 x 8.50—12 Turf
Rear	16 x 6.50—8 Rib

Tire Inflation*

Front	150 kPa (22 psi)
Rear	97 kPa (14 psi)

Dimensions

Wheelbase	1246 mm (49 in.)
Over-all Length	2000mm (78 in.)
Over-all Width (Max.)	1088 mm (42.8)

Approximate Curb Weight . . . 548 Kg (1207 lb.)

**Inflation will vary with attachment used.*

Group 15 Cap Screw Torque

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					U.S. Regular	
Bolt Dia.	U.S. Dec. Equiv.	TORQUE IN FOOT POUNDS			Bolt Head	Nut
1/4	0.260	(8.14 N-m) 6	(13.56 N-m) 10	(18.98 N-m) 14	7/16	7/16
5/16	0.3125	(17.63 N-m) 13	(27.12 N-m) 20	(40.68 N-m) 30	1/2	1/2
3/8	0.375	(31.19 N-m) 23	(47.46 N-m) 35	(67.80 N-m) 50	9/16	9/16
7/16	0.4375	(47.46 N-m) 35	(74.58 N-m) 55	(108.48 N-m) 80	5/8	11/16
1/2	0.500	(74.58 N-m) 55	(115.26 N-m) 85	(162.72 N-m) 120	3/4	3/4
9/16	0.5625	(101.70 N-m) 75	(176.28 N-m) 130	(237.30 N-m) 175	13/16	7/8
5/8	0.625	(142.38 N-m) 105	(230.52 N-m) 170	(325.44 N-m) 240	15/16	15/16
3/4	0.750	(250.86 N-m) 185	(406.80 N-m) 300	(576.30 N-m) 425	1-1/8	1-1/8
7/8	0.875	*(216.96 N-m) 160	(616.98 N-m) 445	(928.86 N-m) 685	1-5/16	1-5/16
1	1.000	(339.00 N-m) 250	(908.52 N-m) 670	(1396.68 N-m) 1030	1-1/2	1-1/2

Multiply readings by 12 for inch-pound values.

* "B" Grade bolts larger than 3/4-inch (19.1 mm) are sometimes formed hot rather than cold, which accounts for the lower recommended torque.

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

SET SCREW SEATING TORQUE CHART

Screw Size	Cup Point	Square Head
Torque in Inch Pounds		
#5	(1.02 N-m) 9	—
#6	(1.02 N-m) 9	—
#8	(2.26 N-m) 20	—
#10	(3.73 N-m) 33	—
1/4	(9.83 N-m) 87	(23.96 N-m) 212
5/16	(18.65 N-m) 165	(47.46 N-m) 420
3/8	(32.77 N-m) 290	(93.79 N-m) 830
7/16	(48.59 N-m) 430	—
1/2	(70.06 N-m) 620	(237.30 N-m) 2100
9/16	(70.06 N-m) 620	—
5/8	(138.43 N-m) 1225	(480.25 N-m) 4250
3/4	(240.13 N-m) 2125	(870.10 N-m) 7700

Divide readings by 12 for foot-pound values

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

2AF:M2B575 M21:1010K C 250882

METRIC HARDWARE TORQUE SPECIFICATIONS

Metric Standard Thread

Thread	8.8		10.9		12.9	
	N-m	(lb-ft)	N-m	(lb-ft)	N-m	(lb-ft)
M5	5.9	(4.4)	7.9	(5.8)	9.8	(7.2)
M6	9.8	(7.2)	13.8	(10.2)	16.7	(12.3)
M8	24.6	(18.1)	34.4	(25.4)	40.2	(29.6)
M10	48.1	(35.5)	67.8	(50.0)	81.5	(60.1)
M12	84.4	(62.2)	118.0	(87.0)	142.0	(105.0)
M14	133.0	(98.0)	187.0	(138.0)	226.0	(187.0)
M16	206.0	(152.0)	290.0	(214.0)	348.0	(257.0)
M18	285.0	(210.0)	398.0	(294.0)	476.0	(351.0)
M20	402.0	(296.0)	570.0	(420.0)	677.0	(499.0)
M22	540.0	(398.0)	765.0	(564.0)	914.0	(674.0)
M24	697.0	(514.0)	980.0	(723.0)	1180.0	(870.0)

Metric Fine Thread

Thread	8.8		10.9		12.9	
	N-m	(lb-ft)	N-m	(lb-ft)	N-m	(lb-ft)
M8 x 1	26.5	(19.5)	37.3	(27.5)	44.2	(32.6)
M10 x 1	47.1	(34.7)	68.8	(50.7)	81.5	(60.1)
M12 x 1.5	88.4	(65.2)	123.0	(91.0)	147.0	(106.0)
M14 x 1.5	147.0	(108.0)	206.0	(152.0)	246.0	(181.0)
M16 x 1.5	221.0	(163.0)	309.0	(228.0)	373.0	(275.0)
M18 x 1.5	319.0	(235.0)	451.0	(333.0)	540.0	(398.0)
M20 x 1.5	451.0	(333.0)	628.0	(463.0)	755.0	(557.0)
M22 x 1.5	599.0	(442.0)	845.0	(623.0)	1030.0	(760.0)
M24 x 2	765.0	(564.0)	1080.0	(796.0)	1275.0	(940.0)
M26 x 2	1130.0	(833.0)	1570.0	(1158.0)	1915.0	(1412.0)

AB6; 053;TORQUE 130385

O-RINGS BOSS FITTING SERVICE RECOMMENDATIONS

1. Inspect boss O-ring seat. It must be free of dirt and defects. If repeated leaks occur, inspect for defects with a magnifying glass. Some raised defects can be removed with a slip stone.

Occasionally a lower durometer O-ring will seal against a rough seat. If neither of these solutions work, the component must be replaced.

2. Put hydraulic oil, petroleum jelly or soap on the O-ring. Put a thimble over the threads to protect O-ring from nicks. Slide O-ring over the thimble and into the turned down section of fitting.

For angle fittings, loosen special nut and push special washer against threads so O-ring can be installed into the turned down section of fitting.

3. Turn fitting into the boss by hand until special washer or washer face (straight fitting) contacts boss face and O-ring is squeezed into its seat.

4. To position angle fittings, turn the fitting counterclockwise a maximum of one turn.

5. Tighten straight fittings to the torque value shown in chart. For angle fittings, tighten the special nut to valve shown in the chart while holding body of fitting with a wrench.

STRAIGHT FITTING OR SPECIAL NUT TORQUE (1)

Thread Size	Torque ¹		Number of Flats ²
	N-m	(lb-ft)	
7/16-20 UNF	12	(9)	2
1/2-20 UNF	16	(12)	2
9/16-18 UNF	24	(18)	2
3/4-16 UNF	46	(34)	2
7/8-14 UNF	62	(46)	1-1/2
1-1/16-12 UN	102	(75)	1
1-3/16-12 UN	122	(90)	1
1-5/16-12 UN	142	(105)	3/4
1-5/8-12 UN	190	(140)	3/4
1-7/8-12 UN	217	(160)	1/2

1. Tolerance $\pm$ 10 percent.

2. To be used if a torque wrench cannot be used. After tightening fitting by hand, put a mark on nut and boss; then tighten special nut or straight fitting the number of flats shown.

TUNE-UP SPECIFICATIONS

Spark plug gap	0.64 mm (0.025 in.)
Spark plug torque	9 to 20 N·m (84.60 to 180 lb. in.)
Compression (at cranking speed)	620 to 690 kPa (90 to 100 psi)
Breaker point gap	0.41 mm (0.016 in.)
Crankcase vacuum	25.4 to 50.8 cm (10 to 20 in. water column)
Idle speed	1300 rpm
High speed	3450 rpm
Implement relief valve pressure	6200 ± 340 kPa (900 ± 50 psi)
Charge relief valve pressure	930 ± 310 kPa (135 ± 45 psi)
Charge pump output	3 gpm (gallons per minute)

TUNE-UP ADJUSTMENTS

Perform tune-up adjustments in the following order to improve the efficiency and operation of the tractor.

Tune-Up Adjustment	Section	Group
1. Clean engine and cooling system.		
2. Clean air cleaner.	CTM-2	
3. Check or replace fuel filter.	30	
4. Check battery electrolyte level.		
5. Check spark.	220	10
6. Check spark plug.	220	10
7. Check compression.	220	10
8. Check breaker points.	CTM-2	
9. Adjust timing.	220	10
10. Adjust carburetor and engine speeds.	220	10
11. Check crankcase breather.	CTM-2	
12. Check crankcase vacuum.	220	10
13. Check and adjust governor.	220	10
14. Check and adjust brakes.	60	
15. Check and adjust hydrostatic control lever linkage.	250	10
16. Check hydrostatic control lever friction adjustment.	250	10
17. Check charge pressure.	250	10
18. Check charge pump output.	250	10
19. Check implement pressure.	250	10
20. Adjust steering axle.	60	
21. Adjust rear wheel toe-in.	60	
22. Check tire pressure.		

FUEL



CAUTION: Handle fuel carefully. If the engine is hot or running, do not fill the fuel tank. Do not smoke while you fill the fuel tank or service the fuel system. Fill fuel tank only to bottom of filter neck.

IMPORTANT: DO NOT mix oil with gasoline.

1. Unleaded fuel is recommended. Regular leaded gasoline with an anti-knock index of 87 or higher may be used. Do not use gasoline that has been stored for a long period of time.

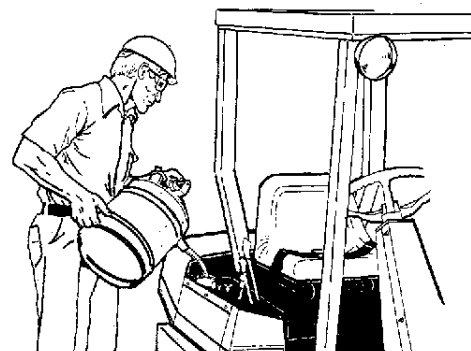
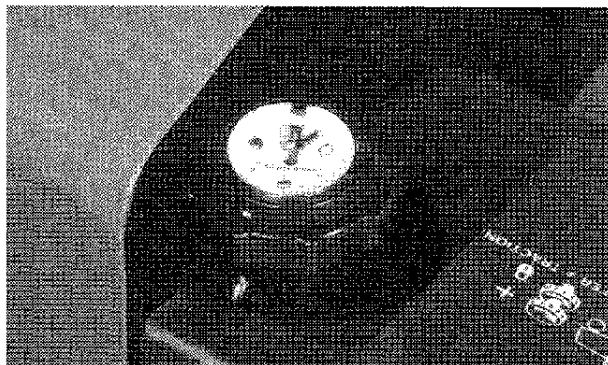
Use of gasohol is acceptable as long as the ethyl alcohol blend does not exceed 10 percent. Unleaded gasohol is preferred over leaded gasohol.

NOTE: Fuel tank capacity:

F910—5.5 gal (21 L)

F930—11 gal (42 L)

2. Fill fuel tank at end of each day's operation. Fill fuel tank only to bottom of filler neck.



6MA;M33767 M38859 M45;FLA A 030985

FUEL STORAGE

Keep fuel in a clean container in a protected area. Water and sediment must be removed before fuel gets to the engine. Do not use de-icers to remove water from fuel. Do not depend on fuel filters to remove water.

If possible, install a water separator at the storage tank outlet. See your John Deere dealer for this part.

IMPORTANT: Keep all dirt, scale, water or other foreign material out of fuel.

If tractor is either stored or used during the winter, add TY6295 John Deere Gasoline Storage Stabilizer or an equivalent to the fuel. Follow directions on can.

M45;1025A 1 100185

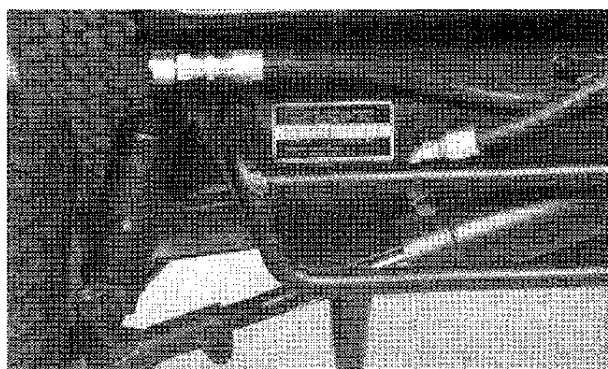
SERIAL NUMBERS

When working on machines or components that are covered by warranty, it is IMPORTANT that you include the tractor Product Identification Number and the component serial number on the warranty claim form.

The location of component serial number plates are shown below.

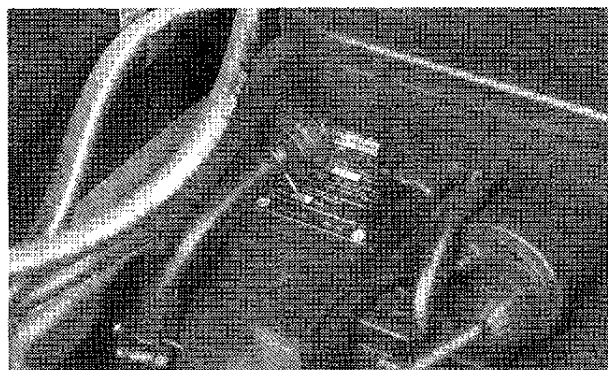
M21;;1030R 1 220485

PRODUCT IDENTIFICATION NUMBER

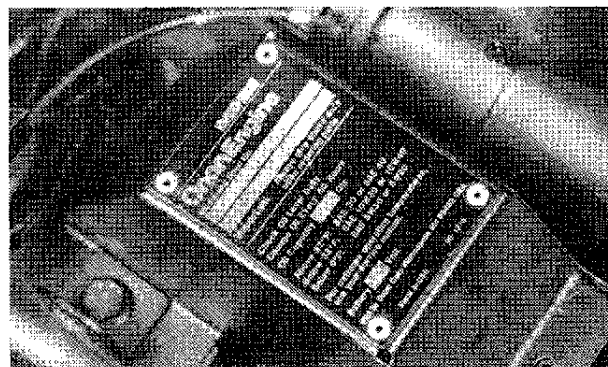


6MA;M33853 M45;;1030A 1 301085

ENGINE SERIAL NUMBER



F910



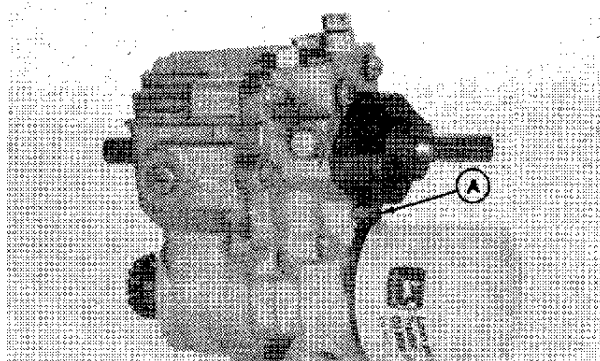
F930

6MA;M33854 M34584 M45;;1030A 2 301085

Serial Numbers

TRANSMISSION SERIAL NUMBER

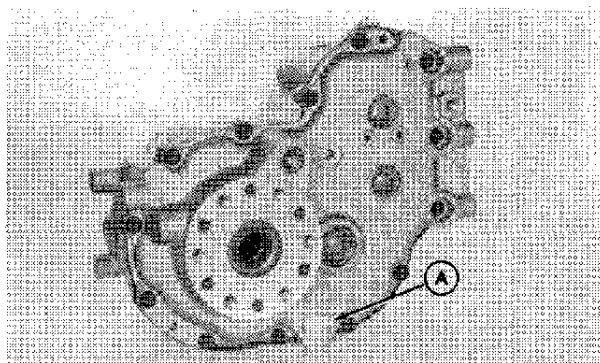
Serial number plate (A) location.



2AF;M38478 M21;;1030R 4 220485

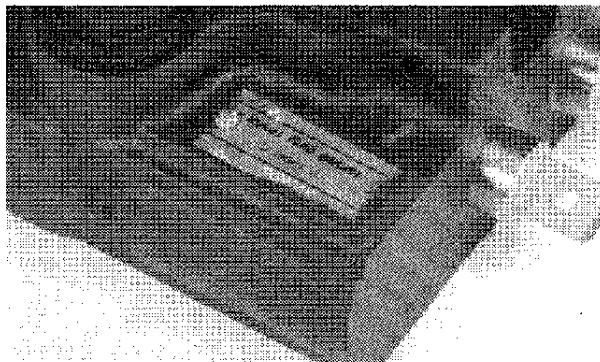
DIFFERENTIAL SERIAL NUMBER

Serial number plate (A) location.



2AF;M38479 M21;;1030R 5 220485

CONTROL VALVE SERIAL NUMBER



2AF;M38480 M21;;1030R 6 220485

Section 20 ENGINE REPAIR

CONTENTS

REPAIR INFORMATION

For complete repair information on the Onan engine, component technical manual CTM-2 is also required.

Use the component manual in conjunction with this machine manual.

See the component manual for instructions on the following subjects:

- Group 05—Air Cleaner and Breather
- Group 10—Intake Manifold and Cylinder Heads
- Group 15—Intake and Exhaust Valves
- Group 20—Flywheel
- Group 25—Camshaft
- Group 30—Connecting Rods and Pistons
- Group 35—Crankshaft and Main Bearings
- Group 40—Lubrication System
- Group 45—Governor
- Group 50—Carburetor
- Group 55—Stator and Regulator-Rectifier
- Group 60—Starter
- Group 65—Breaker Points, Condenser and Ignition Coil

These groups include:

- Disassembly
- Inspection
- Repair
- Assembly

Page

GROUP 05—ENGINE REMOVAL AND INSTALLATION

Service Equipment and Tools	20-05-1
Specifications	20-05-1
Remove Engine	20-05-1
Install Engine	20-05-4

GROUP 10—MUFFLER

Muffler	
Remove	20-10-1
Install	20-10-1

M45;2000A 1 071085

Group 05 ENGINE REMOVAL AND INSTALLATION

SERVICE EQUIPMENT AND TOOLS

NOTE: Order tools from your SERVICE-GARD™ Catalog. Some tools may be available from a local supplier.

Name	Use
Load-Positioning Sling	To remove and install engine

M45;2005A 1 071085

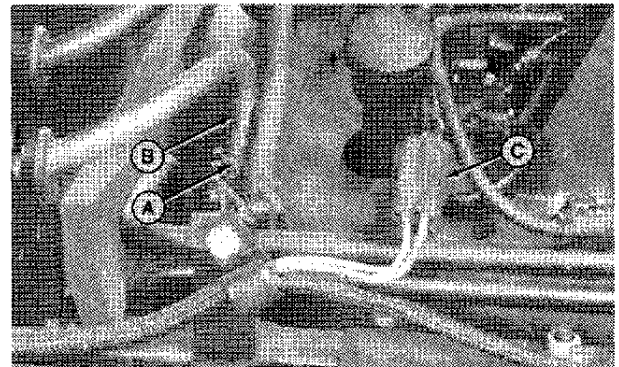
SPECIFICATIONS

Item	Measurement	Specification
Mounting Cap Screws	Torque	39 ± 4 N·m (348 $\pm$ 35 lb-in.)
Driveshaft Cap Screws	Torque	27 ± 3 N·m (240 $\pm$ 27 lb-in.)
PTO Belt Tension Spring	Length	21 mm (0.8 in.)

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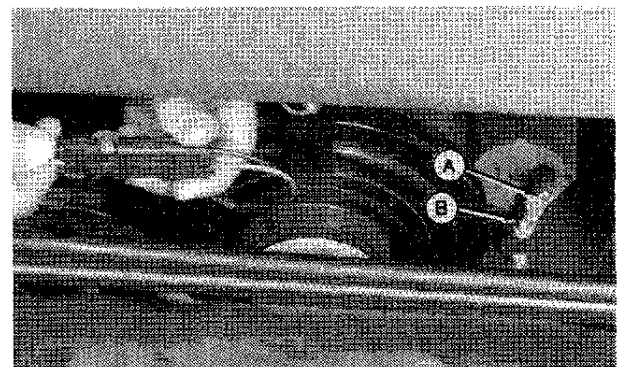
DISCONNECT WIRING AND THROTTLE CABLE

1. Park tractor safely.
2. Disconnect battery negative (—) cable.
3. Move fuel valve to no fuel position.
4. Slide clamp (A) back to disconnect fuel pump inlet hose (B).
5. Disconnect wiring harness connector (C).



5A0;M36897 M45;2005A 3 071085

6. Disconnect electric PTO clutch wiring lead.
7. Remove nut (A) to disconnect starter cable (B).



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Thank you so much for reading

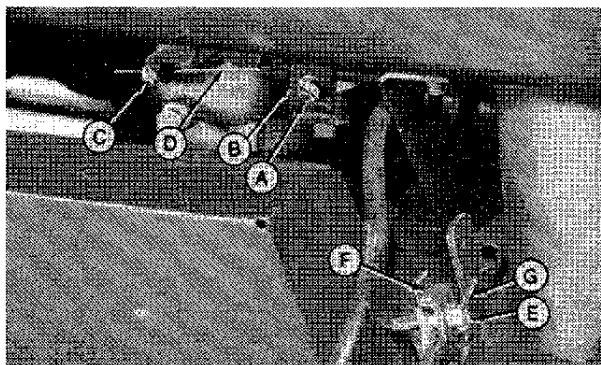
Engine Removal and Installation

8. Loosen cap screw (A), clamp (B), and screw (C) to disconnect choke cable (D).

9. Loosen cap screw (E) and clamp (F) to disconnect throttle cable (G).

A—Cap Screw
B—Clamp
C—Screw
D—Choke Cable

E—Cap Screw
F—Clamp
G—Throttle Cable

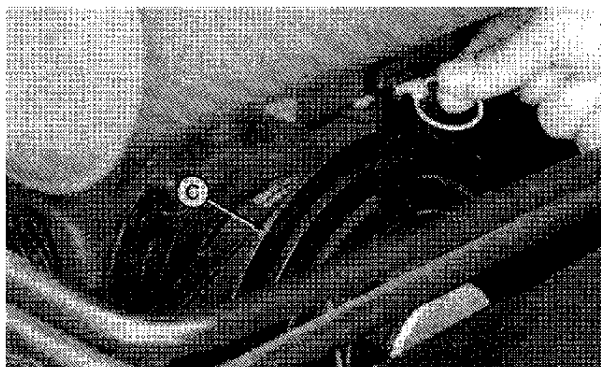
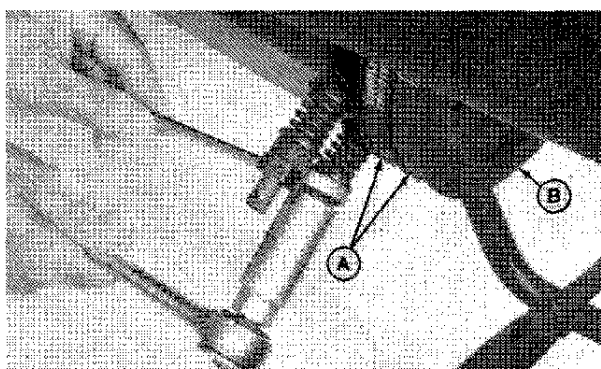


5A0;M36899 M45;2005A 5 071085

DISCONNECT DRIVESHAFT AND OIL LINES

1. Loosen lock nuts to release spring tension. Remove two belts (A) from PTO pulley (B).

2. Pull pin and remove belts from electric PTO clutch (C).

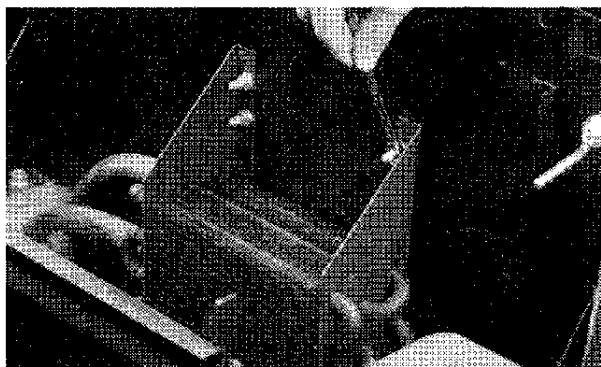


5A0;M36900 M36901 M45;2005A 6 071085

3. Loosen three wing nuts to remove air intake screen.

IMPORTANT: Do not damage oil cooler fins when working in the driveshaft area.

4. Remove four nuts and cap screws. Move oil cooler from the driveshaft area.



5A0;M36081 M45;2005A 7 071085

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