



# 8850 Tractor



JOHN DEERE

## TECHNICAL MANUAL 8850 Tractor

TM1254 (01FEB85) English

**John Deere Waterloo Works**  
**TM1254 (01FEB85)**

LITHO IN U.S.A.  
ENGLISH



# 8850 TRACTOR TECHNICAL MANUAL TM-1254 (FEB-85)

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U10;0106EN AX2 040385

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# Introduction and Safety Information

## INTRODUCTION

This technical manual is part of a twin concept of service.

### **FOS Manuals - for reference**

### **Technical Manuals - for actual service**

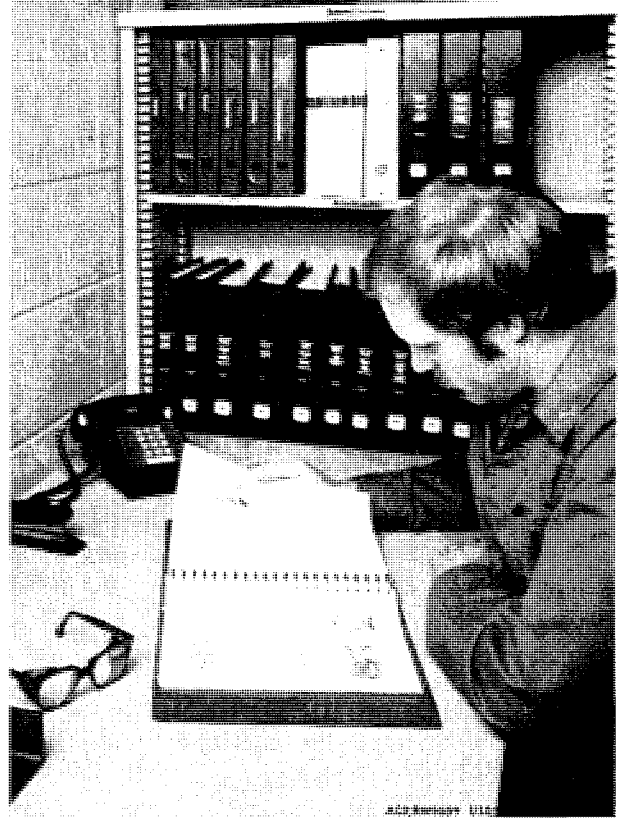
The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

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

*Technical Manuals* are concise service guides for specific machines. They are on-the-job guides containing the information needed by the service technician.

There are two technical manuals covering these machines:

- The repair manual, identified by green section tabs, and
- The operation and test manual, identified by yellow section tabs. These sections correspond respectively to the 2-digit repair sections.

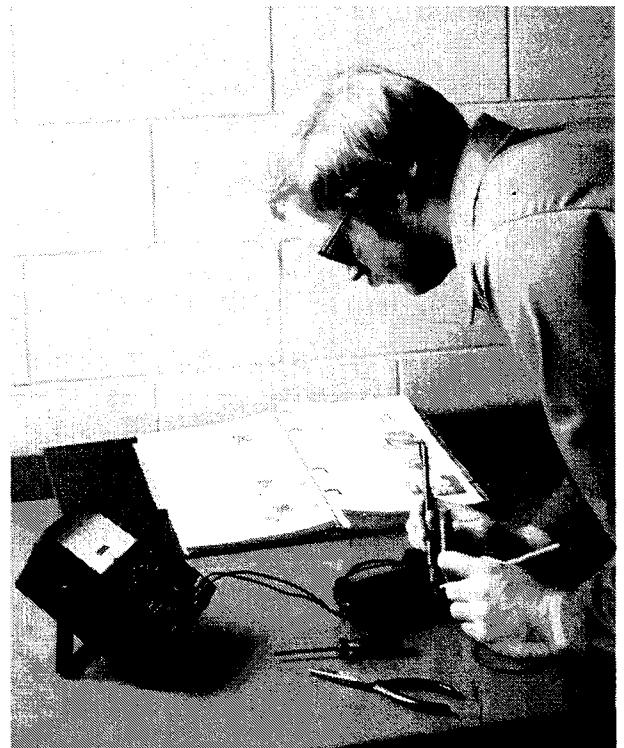


## FEATURES OF THIS TECHNICAL MANUAL

- John Deere ILLUSTRATION format emphasizing more detailed pictures and fewer words.
- Instructions and illustrations grouped together in easy-to-use modules.
- Removal and Installation groups preceding some repair groups. These groups show how to remove and install components from the machine rather than from major components. They also show how to acquire access to major components of a machine.
- A section showing how to separate the tractor.

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

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.



AC3;RW5560 U10;010INT B 101281

## SAFETY MESSAGES



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

U10:0101NT C 101281

## IMPORTANT

The **IMPORTANT** message identifies potential problems which may cause consequential damage to tractor. Following recommended procedure will instruct technician how to avoid problem.

U10:0101NT D 101281

## NOTES

The word *NOTE* is followed by a statement that identifies a qualification or exception to a previous statement. A "NOTE" may also identify nice-to-know information pertinent to, but not directly related to previous statement.

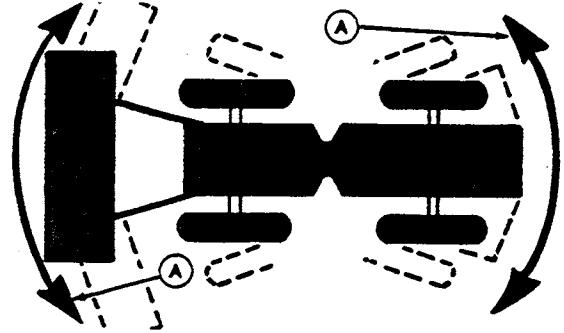
U10:0101NT E 101281

### STAY CLEAR OF MOVING TRACTOR

Be sure everyone is clear of tractor and attached equipment before starting engine or moving steering wheel. Tractor and equipment move (A), even with transmission in PARK. Some steering movement often occurs as engine starts.

Never try to get on or off a moving tractor.

Before dismounting, place the transmission in PARK and lower implements to the ground. If tractor is to be left unattended, stop the engine and remove the key.



AC3;RW8078 U10;010INT F 250285

### PREVENT MACHINE RUNAWAY

Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is by passed.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in neutral or park.



AB6;TS177 U01;BYPAS1 040385

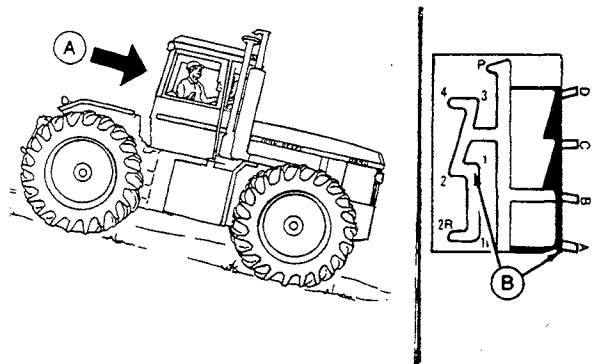
### TRANSPORT TRACTOR SAFELY

Before descending a steep hill (A), shift to a low gear (B) to control the tractor with little or no braking. Never coast downhill.

When transporting on icy or graveled surfaces, be alert for skids which could result in loss of steering control. To decrease chance of skids, reduce speed and be sure tractor is properly ballasted.

Never tow tractor faster than 8 km/h (5 mph) with all wheels on the ground. With rear wheels raised, never tow tractor faster than 16 km/h (10 mph).

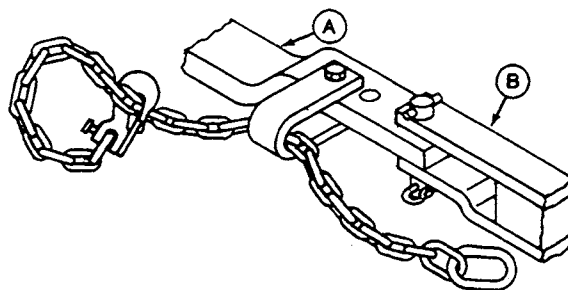
Use of radial ply tires require special precautions, see Operator Manual.



AC3;RW4421 U10;010INT G 030484

## USE A SAFETY CHAIN

A safety chain will help control drawn equipment (B) should it accidentally separate from the drawbar (A) while transporting. Using the appropriate adapter parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning. See your John Deere dealer for a chain with a strength rating equal to or greater than the gross weight of the towed machine.



AB6;TS163 053;CHAIN 310884

## TOW EQUIPMENT PROPERLY

Use caution when towing loads at transport speeds. Reduce speed if towed load weighs more than the tractor and is not equipped with brakes. Avoid hard braking applications. (Consult implement operator's manual for recommended transport speeds.)

Use additional caution when transporting towed loads under adverse surface conditions, when turning, or on inclines.

U01;TOW 061284

## USE ADEQUATE SERVICE FACILITIES

Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment.

Make sure the service area is adequately vented.

Periodically check the shop exhaust system for leakage. Engine exhaust gas is dangerous.

Be sure all electrical outlets and tools are properly grounded.

Use adequate light for the job at hand.

Use lifting equipment and safety stands which have adequate strength for the job being performed.

Wear fairly tight clothing.

Know where the first aid kit and fire extinguishers are located, and know how to use them.

U10;010INT I 210183

## SERVICE TRACTOR SAFELY

Do not service the tractor while it is in motion or while the engine is running.

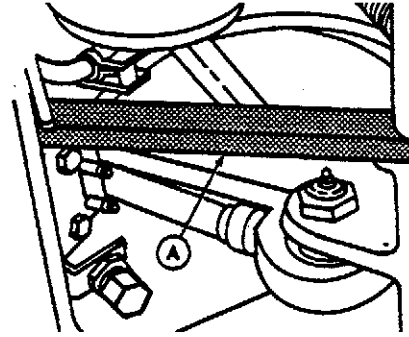
Stay clear of hinge area when engine is running. Stop engine and remove key before working near hinge.

Drive shaft does not turn at engine start-up until clutch pedal is depressed and released. Be aware of sudden rotation of drive shaft as clutch is actuated.

Install lock bars (A) on tractor hinge before performing service work in hinge area. Be sure lock bars are removed before operating tractor.

Disconnect the battery ground cable before working on the electrical system or working in any area when you might accidentally contact electrical components. A short circuit could cause burns as well as damaging the electrical system.

Reinstall all shields removed during service.



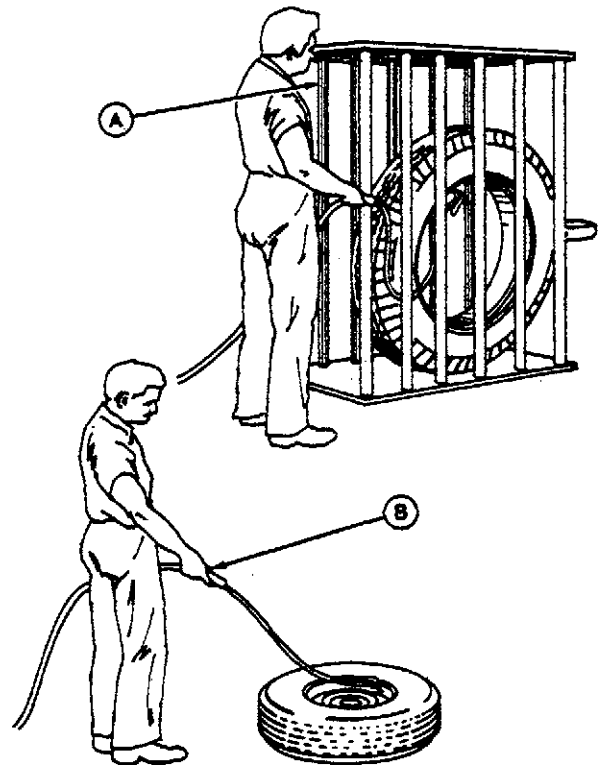
AC3:RW8506 U10;010INT AX2 2101B3

## 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.

When sealing tire beads on rims, never exceed 240 kPa (2.4 bar) (35 psi) 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 agricultural tire mounting instructions, including necessary safety precautions, are contained in John Deere Fundamentals of Service (FOS) Manual 55. Such information is also available from the Rubber Manufacturers Association and from tire manufacturers.

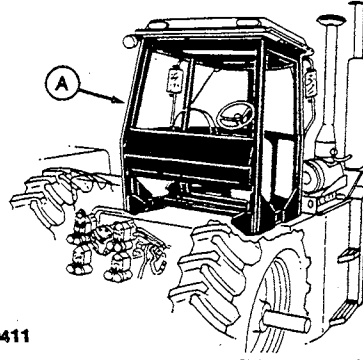


AC3:TS0123 U10;010INT L 0304B4

### DO NOT MODIFY TRACTOR

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

Never modify structural members of SOUND-GARD body (A) by welding, bending, drilling or cutting as this might weaken the structure. If any structural member is damaged, replace the entire structure. Do not attempt repairs.



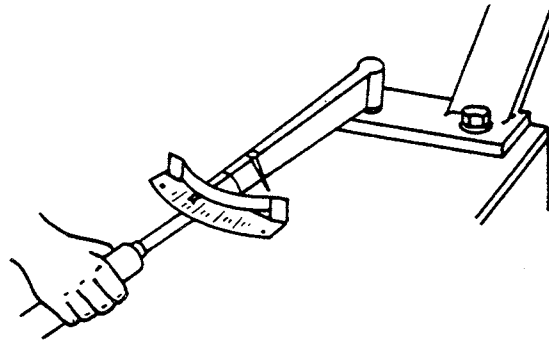
RW10411

AJ7;RW1041 1 U01;MODIFY 4WD 250585

### KEEP ROPS INSTALLED PROPERLY

Make certain all parts are reinstalled correctly if the roll-over protective structure (ROPS) is loosened or removed for any reason. Tighten mounting bolts to proper torque.

The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered. A damaged ROPS should be replaced, not reused.

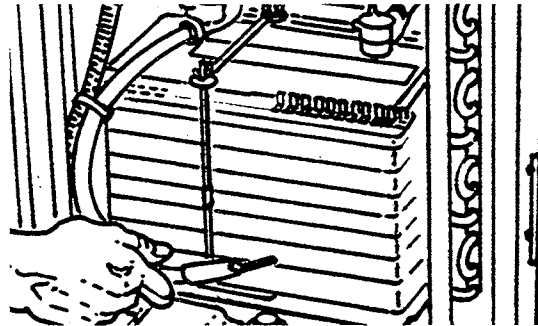


AB6;TS176 053;ROPS3 261184

### OBSERVE ELECTRICAL SERVICE PRECAUTIONS

Keep all sparks and flames away from batteries, as gas given off by electrolyte is explosive. To avoid sparks, connect ground cable last and disconnect it first. When using a booster battery, follow instructions in Operator's Manual.

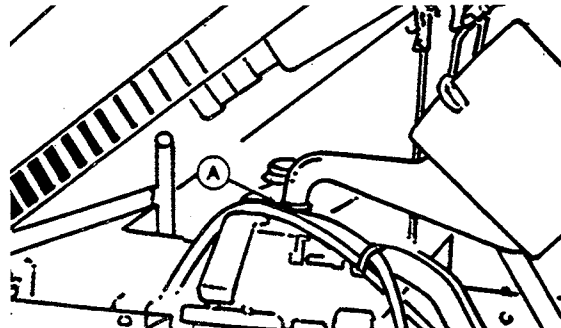
To avoid shocks and burns, disconnect battery ground cable before servicing any part of electrical system.



AC3;RW8074 U10;010INT BX2 061282

### SERVICE COOLING SYSTEM SAFELY

If radiator cap (A) must be removed, do not remove it when engine is hot. Shut the engine off and wait until it cools. Then turn the cap to the first stop to relieve pressure before removing it completely.

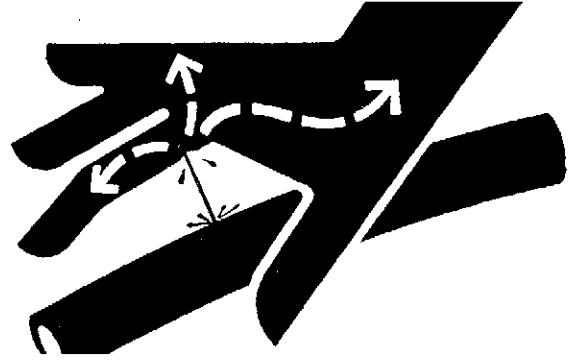


AC3;RW8076 U10;010INT SX2 061282

### 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.

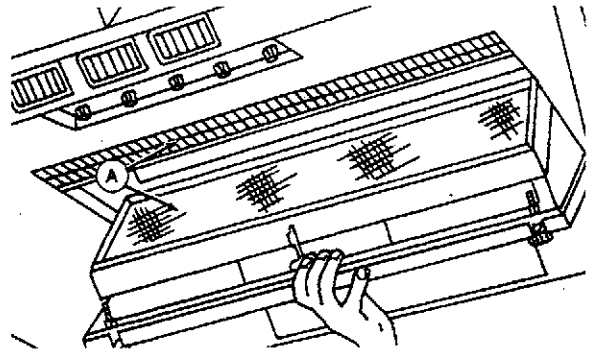
If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.



AB6;X9811 053;FLUID 100584

### HANDLE CHEMICALS PROPERLY

SOUND-GARD body air filters (A) are not designed to filter out harmful chemicals. Follow instructions given in the implement operator's manual and those given by the chemical manufacturer when using agricultural chemicals.

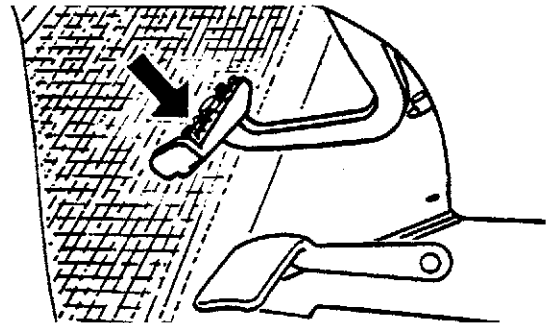


AJ7;RWS704L U01;HANDLE 2 311084

### SERVICE BRAKE ACCUMULATOR SAFELY

Relieve all pressure from accumulator before disconnecting brake accumulator or brake valve. To do so open bleed screws and pump brake pedal with engine stopped, until pedal easily goes all way down.

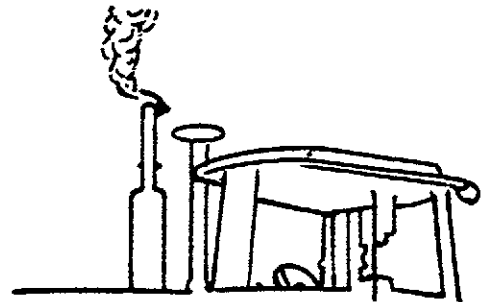
The accumulator is charged with dry nitrogen to a pressure of 500 psi (3450 kPa) (35 bar). If it needs recharging, have job done only by a qualified service person and only with dry nitrogen.



AC3;RW8103 U10;010INT FX1 220283

### AVOID EXHAUST FUMES

Never run engine in a closed building. Make sure service area is adequately ventilated.



AJ7;RW8075 U01;FUMES 1 250285

### AVOID EXPLOSIONS OR FIRE

Batteries produce explosive gas. Before using booster batteries, read instructions in operator's manual.

Before connecting or disconnecting battery charger, turn the charger off to avoid sparks. See instructions in operator's manual.

Be careful with starting fluid or any type fuel.

Never smoke while handling fuel.

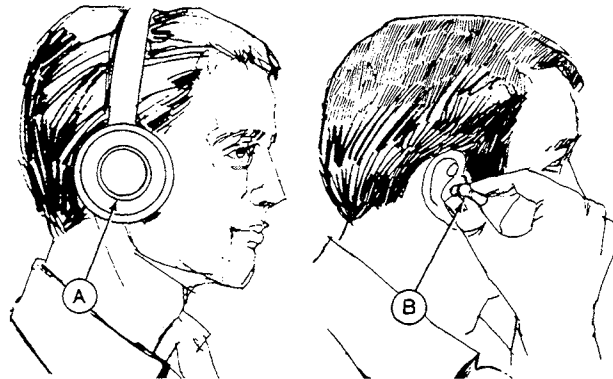


AC3;RW5895 U10;AVOID FIRE 250285

### PROTECT AGAINST NOISE

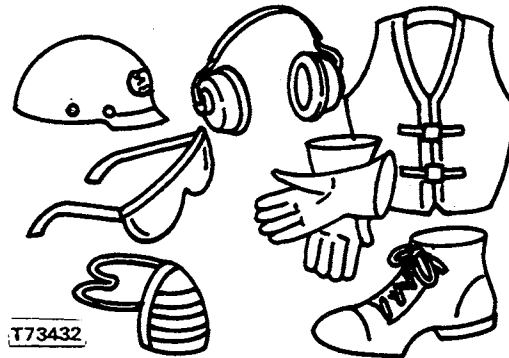
Prolonged exposure to loud noise can cause impairment or loss of hearing.

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



AC3;RW213 U10;010INT Q 100682

### WEAR SAFETY EQUIPMENT



T73432

AC3;T73432 U10;SAFETY EQUIP 250285

# Section 10 GENERAL

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**GROUP 15 - LUBRICATION**

Lubricate Tractor Properly .....	10-15-01
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Transmission - Hydraulic Oils .....	10-15-02
Grease .....	10-15-02
Use Approved Alternative Lubricants .....	10-15-03
Store Lubricants Correctly .....	10-15-03
Lubrication Services (Chart) .....	10-15-04
Check Engine Oil Level .....	10-15-05

*Continued on next page*

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**CONTENTS—CONTINUED**

**GROUP 15 - LUBRICATION - Continued**

Check Engine Oil and Oil Filter .....	10-15-05	Lubricate Steering Cylinder Rear	
Clean Crankcase Vent Tube .....	10-15-05	Pivot Pins .....	10-15-08
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Level .....	10-15-06	Rear Pivot Pin .....	10-15-08
Replace Hydraulic Oil Filter .....	10-15-06	Lubricate Remote Grease Fittings .....	10-15-09
Change Transmission-Hydraulic Oil .....	10-15-06	Lubricate Wide Swing Drawbar .....	10-15-09
Clean Transmission-Hydraulic Oil		Lubricate Outer Bearing Supports .....	10-15-09
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Lubricate Hinge Pins .....	10-15-08	Lubricate Front Differential Front	
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## SPECIFICATIONS AND SPECIAL TOOLS

## GENERAL TRACTOR SPECIFICATIONS

## ENGINE

Power (Factory observed PTO at 2100 rpm)	300 hp (224 kw)
Type	8-cylinder, V-8, dual valve in head, diesel, turbocharged and intercooled
Slow idle speed	800 rpm
Working speed range	1500 to 2100 rpm
Bore and stroke	5.51 X 5.00 in. (140 X 127 mm)
Displacement	955 cu. in. (15.6 L <sup>3</sup> )
Compression ratio	14.2 to 1
Firing Order	1L-4R-2R-2L-3R-3L-4L-1R
Valve clearance	
Intake	0.016 in. (0.40 mm)
Exhaust	0.023 in. (0.060 mm)
Crosshead clearance	0.000 to 0.001 in. (0.000 to 0.025 mm)
Injection pump timing	TDC
Lubrication system	forced-feed, pressurized with full-flow and bypass filters

## CAPACITIES

Fuel tank	240 U.S. gal. (908 L)
Cooling system	78 U.S. qts. (74 L)
Crankcase (with filter change)	51 U.S. qts. (48 L)
Transmission-hydraulic system	45.5 U.S. gal. (172.2 L)

TIRES AND TREADS ..... See Section 80

## GENERAL DIMENSIONS

Wheelbase	133 in. (3.38 m)
Overall length	258 in. (6.55 m)
Height to muffler cover*	157 in. (3.96 m)
Height to top of SOUND-GARD body*	129 in. (3.25 m)
Overall width	127.5 in. (3.24 m)
Width at roof	55 in. (1.38 m)
Turning radius	19 ft. (5.79 m)

SHIPPING WEIGHT\*\* ..... 36,074 lbs. (16,360 kg)

\*Tractor equipped with 20.8 to 38 dual

\*\*Equipped for average field service, without fuel and ballast

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**GROUND SPEEDS**

Travel speeds are shown at right with 20.8-38 R-1 tires.  
Adjust as follows for other tires:

Tire Size	Tread	Changes in Speeds
20.8-38	R-1	Base tire
20.8R-38	R-1	2.8% faster
20.8-38	R-2-0	1.4% faster
23.1-34	R-1	2.8% slower
23.1-34	R-2-0	2.0% faster
24.5-32	R-1	3.9% slower
24.5R-32	R-1	1.8% slower
24.5-32	R-2-0	Same as base tire
30.5L-32	R-1	1.0% slower
30.5L-32	R-1	0.5% slower
20.8-42	R-1	6.0% faster
20.8R-42	R-1	7.3% faster

*NOTE: Speed listed should only be used for the speed the tractor is traveling at when using a specified gear.*

\* Ground speeds for tractors with transmission serial number TSGC1003096RX and up. Ground speeds in A, C, and D ranges are not affected by serial number change.

**TRACTOR TRAVEL SPEEDS**

Range	Gear	2100 Engine RPM	
		MPH	KM/H
A	1	2.08	3.35
	2	2.59	4.17
	3	3.76	6.05
	4	4.69	7.55
	1R	3.96	6.37
	2R	4.95	7.96
B	1	4.75	7.65
	2	5.70	9.17
	3	8.24	13.26
	4	10.29	16.56
	1R	8.76	14.10
	2R	10.94	17.60
C	1	5.53	8.90
	2	6.90	11.10
	3	9.99	16.07
	4	12.46	20.05
	1R	10.54	16.96
	2R	13.15	21.16
D	1	8.96	14.42
	2	11.18	17.99
	3	16.19	26.05
	4	20.20	33.50

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**PREDELIVERY SPECIFICATIONS**

Injection Pump Timing .....	TDC
Engine Speeds	
Slow Idle .....	800 rpm
Fast Idle .....	2300 rpm
Fast Idle at Full Load .....	2100 rpm
Clutch Pedal Height .....	5½ in. (140 mm)
Brake Pedal Free Travel .....	3 in. (8 mm)
Torques	
Wheel Sleeve Half-to-Wheel .....	300 ft-lbs. (407 N·m)
Rim Clamp-to-Wheel .....	170 ft-lbs. (230 N·m)
Outside Dual-to-Hub .....	300 ft-lbs. (407 N·m)
Air Intake Clamps .....	6 ft-lbs. (8.5 N·m)
Fan, Compressor, and Alternator Belt Tension .....	85-95 lbs. (380-425 N)

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### TUNE-UP

Power (Factory Observed PTO at 2100 rpm) .....	300 hp (224 kw)
Compression .....	325 psi (2240 kPa) (22 bar)
Vacuum at 2100 rpm (clean air filters) .....	22-27 in. (5.47-6.72 (kPa)
Thermostat Opening Temperature .....	180°F (82°C)
Radiator Cap Pressure Release .....	14-17 psi (0.9-1.2 bar)
<b>Engine Speeds</b>	
Slow Idle .....	800 rpm
Fast Idle .....	2300 rpm
Fast Idle at Full Load .....	2100 rpm

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### LUBRICATION

Engine Crankcase .....	50.7 U.S. qts. (48 L)
Transmission-Hydraulic System .....	45.5 U.S. gal. (172.2 L)
<b>Service Intervals</b>	
Check Engine Oil Level .....	10 Hours
Check Transmission-Hydraulic Oil Level .....	10 Hours
Change Engine Oil and Filters .....	200 Hours
Clean Engine Vent Tube .....	600 Hours
Change Hydraulic Oil Filter .....	600 Hours
Clean Filter Screens .....	1200 Hours
Change Transmission-Hydraulic Oil .....	1200 Hours
Change Transmission Filter .....	Annually or with indicator lamp
<b>Lubricate Grease Fittings</b>	
Hinge Pins .....	10 Hours
Steering Cylinder Pivot Pins .....	10 Hours
Feedback Cylinder Pivot Pins .....	10 Hours
U-joints and Slip Joints .....	10 Hours
Axle Bearings .....	10 Hours
Wide Swing Drawbar .....	10 Hours
Outer Shaft Bearing Supports .....	200 Hours
3-Point Hitch .....	200 Hours
Front Differential Pivots .....	600 Hours

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## ENGLISH TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is  $\pm 20\%$ .

Bolt Diameter	Plain Head*		Three Radial Dashes*		Six Radial Dashes*	
	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
1/4 in.	6	8	9	12	12	16
5/16 in.	10	14	18	24	25	34
3/8 in.	20	27	30	41	45	61
7/16 in.	30	41	50	68	70	95
1/2 in.	45	61	75	101	110	149
9/16	70	95	110	150	155	210
5/8 in.	95	128	155	210	215	290
3/4 in.	165	225	270	365	385	520
7/8 in.	170	230	435	590	620	840
1 in.	255	345	660	895	930	1260

Torque figures indicated above and in the Specification Sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

\* Torque value for bolts and cap screws are identified by their head markings.

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## METRIC TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is  $\pm 20\%$ .

Bolt Diameter	Property Class 8.8*		Property Class 10.9*	
	lb-ft	N-m	lb-ft	N-m
M5	5	6	7	9
M6	8	10	11	15
M8	18	25	27	37
M10	37	50	54	73
M12	64	87	96	130
M16	159	215	236	320
M20	321	435	458	620
M24	554	750	790	1070

Torque figures indicated above and in the Specification Sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

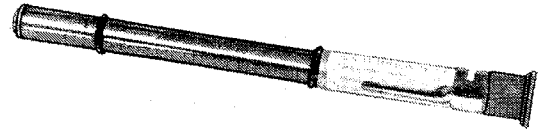
\* Torque value for bolts and cap screws are identified by their property class head markings.

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### SPECIAL TOOLS

*NOTE: Order tools from your Service-Gard Catalog, unless otherwise indicated.*

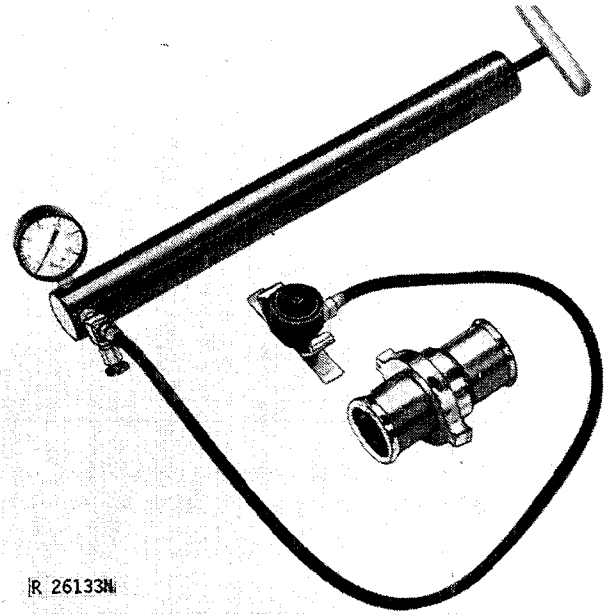
JDST-28 Belt Tensioning Tool is used for checking fan belt tension.



R 26415N

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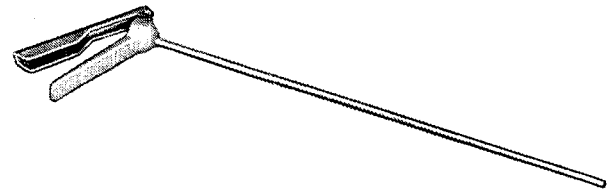
D-05104ST Radiator Tester is used for pressure testing cooling system and radiator caps.



R 26133N

A14;R26133N U03;01000 I 070283

AR62377 Dry Element Cleaning Gun is used for cleaning air filter.

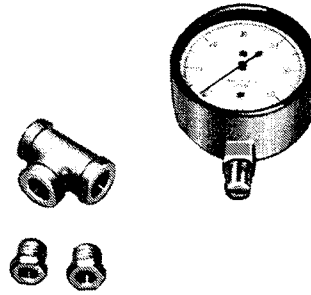


R27167N

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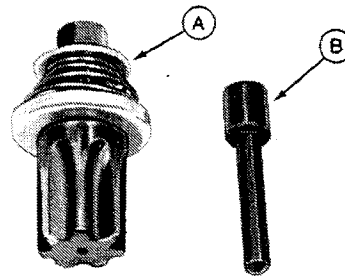
*Specifications and Special Tools*

D-05022ST Water Vacuum Gauge is used to measure air intake vacuum.



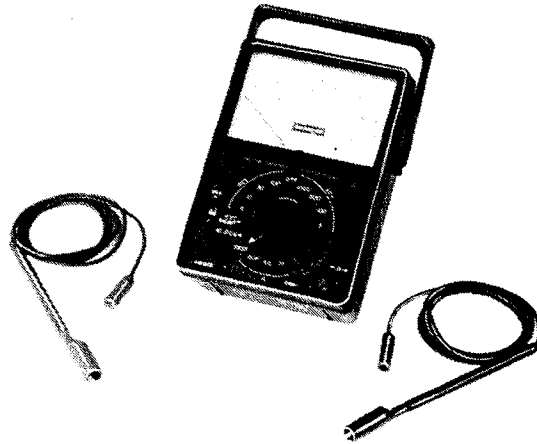
AC1/R27168 U10:010000 MX2 171181

JDG-241 Engine Rotation Tool (A) and JDG-242 Timing Pin (B) are used to turn engine to TDC to check injection pump timing.



AC1/R26134 U10:010000 IX2 171181

D-19001TT Volt-Ohm-Amp Meter is used to test any electrical components for voltage, resistance, or current draw.



AC1/R28795 N U10:010000 JX2 171181

**PREDELIVERY, DELIVERY AND AFTER-SALE SERVICES****DEALER PREDELIVERY SERVICE**

The John Deere delivery receipt, when properly filled out and signed by the dealer and customer, verifies that predelivery and delivery services were satisfactorily performed. When delivering the tractor, give the customer his copy of the delivery receipt and operators manual. Be sure to explain their purposes to him.

Because of the shipping factors involved, plus extra finishing touches necessary to promote customer satisfaction, there are certain predelivery services that must be performed by the dealer. These services are listed in the first of two sections on the predelivery form which is attached to the tractor. The second section is a list of factory inspections that must be verified by the dealer.

Fill the form in completely and sign it. Send a copy to the factory and file the original with the shop order for the job. This will certify that the proper predelivery service has been completed.

Using the following illustrated procedures, perform all services listed and check each job off as it is completed.

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**1. CHARGE BATTERY (IES) (IF NEEDED).**

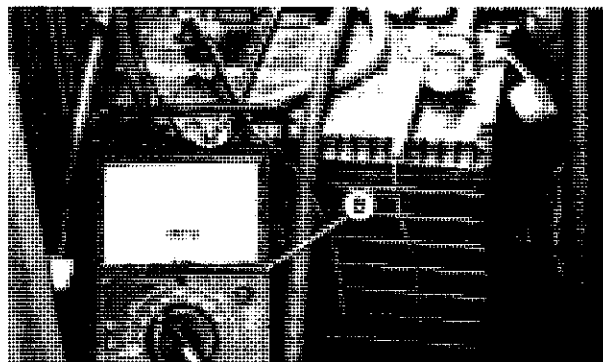
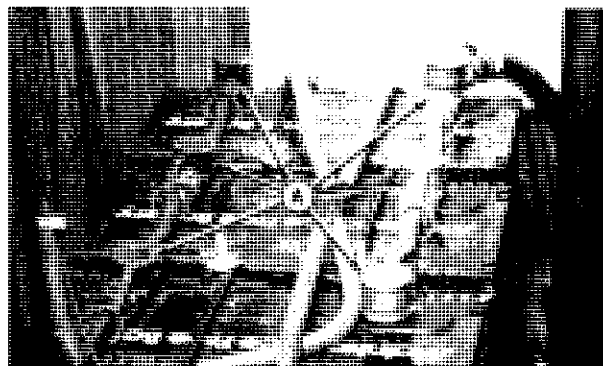
Check batteries for proper charge. With stop cable pulled out, turn key on and crank engine for 5 seconds. This will remove the surface charge from batteries.

Remove side screens on right and left side and then remove negative and positive series connectors (A) from batteries.

Use D-19001TT Volt-Ohm Meter (B) to check voltage. Use chart to find what per cent of charge batteries are charged.

**OPEN CIRCUIT VOLTAGE TEST**

12-V battery	% of charge
12.6 or more	100
12.4	75
12.2	50
12.0	25
11.7 or less	0



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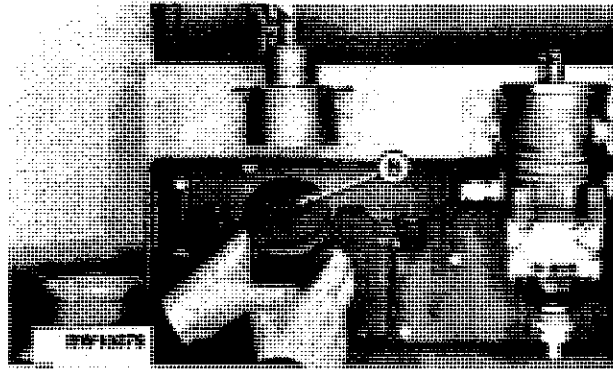
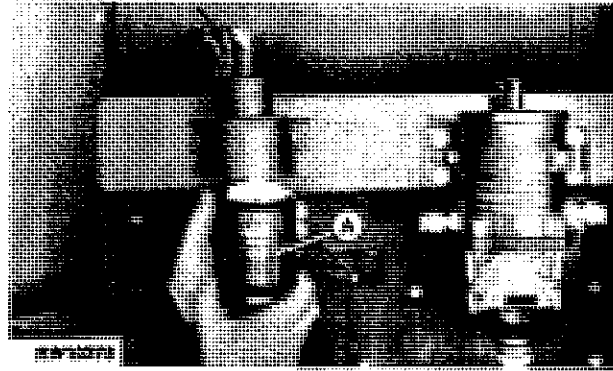
## 2. INSTALL STARTING FLUID CAN.

**CAUTION:** Starting fluid is highly flammable. Do not use near fire, sparks or flames.

**IMPORTANT:** To avoid engine damage, inject fluid only in small amounts and only while engine is turning. Do not depress button longer than one second at a time.

Install starting fluid can (A). To check operation, inject starting fluid by depressing button on dash.

**IMPORTANT:** To avoid drawing dust into engine, always keep a starting fluid can in position or clean bottom of canister and install bottom side up (B).



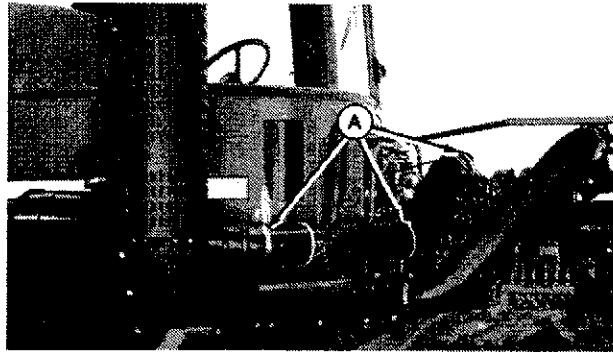
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## 3. TIGHTEN AIR INTAKE CONNECTIONS

Tighten air intake connections at air cleaner (A) to 8.5 N-m (6 ft-lbs) torque.

**NOTE:** When sealing any joint on air intake pipe, refer to Section 30, Remove/Install - Air Intake System.

Inspect exhaust system for leaks or restrictions.



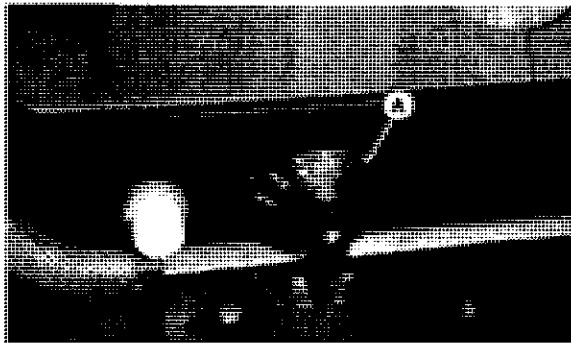
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## 4. ADJUST ALL LAMPS.

Make sure lights work properly when switch (A) is in following positions:

- OFF — To turn off lights
- W — To turn on warning lamps
- H — To turn on dual-beam head lamps, warning lamps, and red tail lamps
- F — To turn on dual-beam head lamps, and flood lamps

Adjust flood lamps for maximum field operation.



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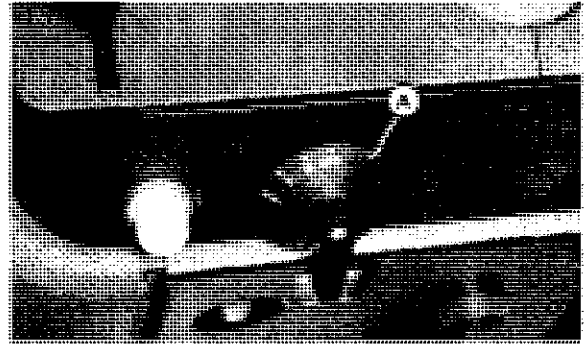
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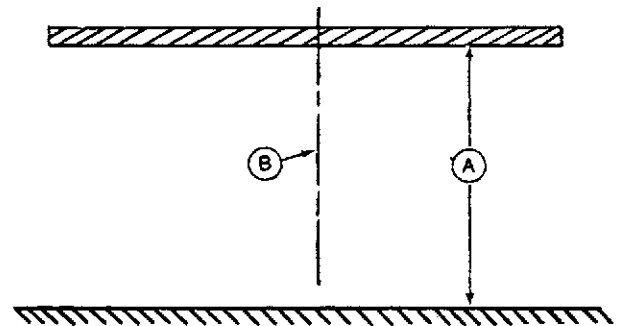
Adjust flood lamps for maximum field operation.



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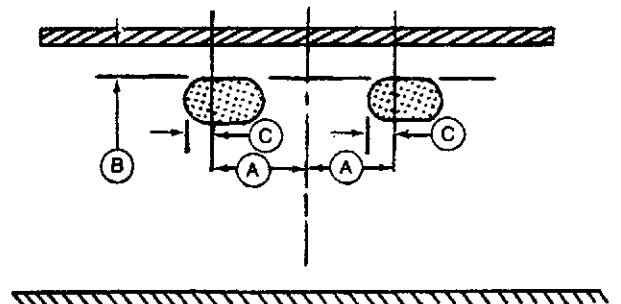
#### TO AIM HEAD LAMPS:

1. Park tractor on level ground, 8 m (25 ft.) from a wall.
2. Measure height of center lamps above the ground, and place a strip of masking tape on wall at same height (A).
3. Sight across steering wheel and hood ornament to locate tractor centerline, mark this spot on tape (B).



AC2:RW4890 U10:010005 BXX3 010782

4. From centerline mark a point 305 mm (12 in.) out in each direction (A). This locates a point directly in front of each lamp center.
5. Turn light switch to "H" and dimmer switch to low beam.
6. Locate small zone of bright light projected by each lamp. Cover other lamps if necessary. Top of zone should be 130 mm (5 in.) lower than lamp center (B). Left edge of zone should be 130 mm (5 in.) left of lamp center (C).



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