

2440 AND 2640 TRACTORS (S/N -340999)

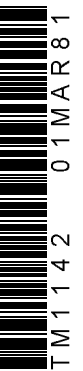


TECHNICAL MANUAL 2440 AND 2640 TRACTORS (S/N -340999)

TM1142 (01MAR81) English

**JOHN DEERE TRACTOR WORKS
TM1142 (01MAR81)**

LITHO IN THE U.S.A.
ENGLISH



**2440 AND 2640
TRACTORS**
(Serial No. -340999)
TECHNICAL MANUAL
TM-1142 (Sep-75)

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GENERAL 10

ENGINE 20

FUEL SYSTEM 30

ELECTRICAL SYSTEM 40

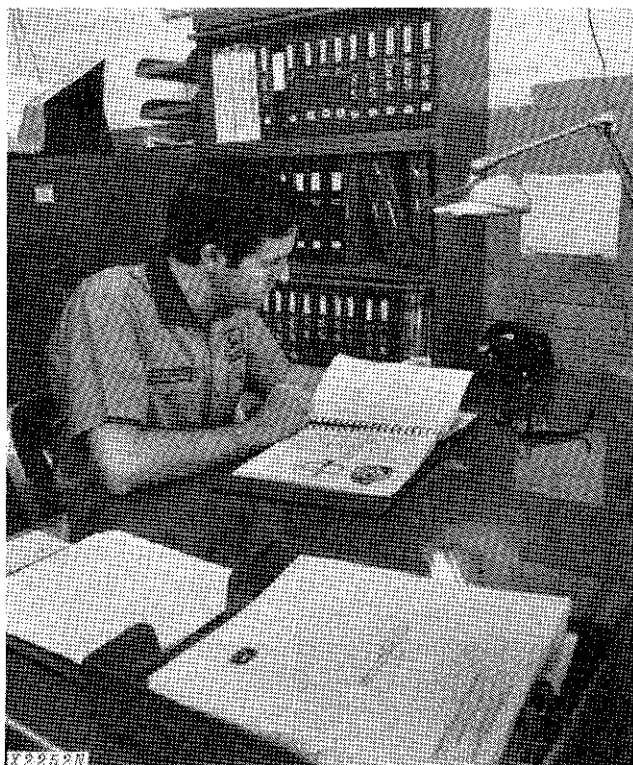
POWER TRAIN 50

STEERING AND BRAKES 60

HYDRAULIC SYSTEM 70

MISCELLANEOUS 80

INTRODUCTION



Use FOS Manuals for Reference

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

- **FOS Manuals—for reference**
- **Technical Manuals—for actual service**

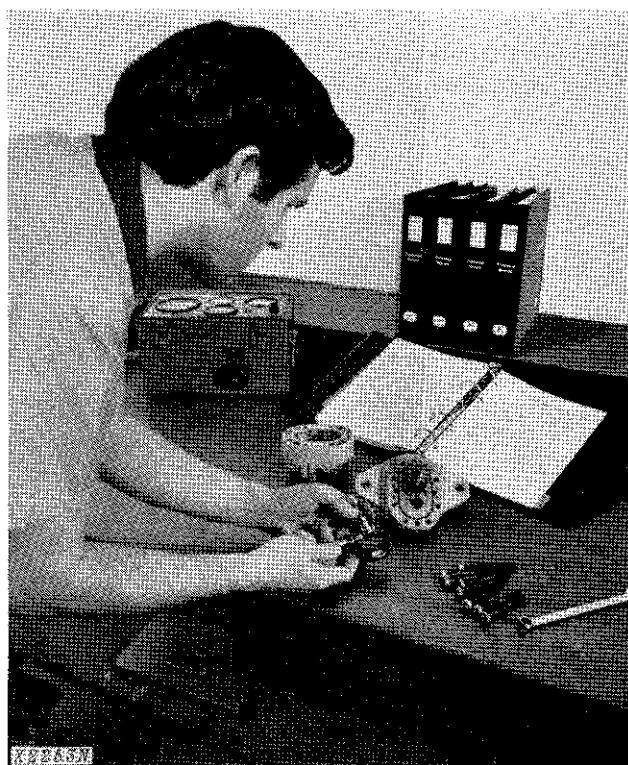
The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

Fundamentals of Service (FOS) Manuals cover basic theory of operation, *fundamentals* of trouble shooting, *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 a specific machine. Technical Manuals are on-the-job guides containing only the vital information needed by an experienced technician.



When a service person should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.



Use Technical Manuals for Actual Service

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

This technical manual was planned and written for you—an experienced technician. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about 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.



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

Section 10 GENERAL

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Group 5 GENERAL TRACTOR SPECIFICATIONS (2440)

ENGINE

Maximum PTO horsepower* ..	60.65 (45.23 kW)
Number of cylinders	4
Bore and stroke	4.02 in. (102 mm) x 4.33 in. (110 mm)
Displacement	219 in. ³ (3590 cm ³)
Compression ratio	16.8 to 1
Firing Order	1-3-4-2
Intake valve clearance	0.014-in. (0.35 mm)
Exhaust valve clearance	0.018-in. (0.46 mm)
Slow idle	800 rpm
Fast idle	2650 rpm

*Official test at 2500 engine rpm (650 or 1210 PTO rpm)

ELECTRICAL SYSTEM

Battery dry voltage	12 volts
Battery specific gravity at full charge (corrected to 80°F [27°C])	1.260
Battery terminal grounded	negative

CAPACITIES

Fuel tank	19-1/2 gals. (73.8 L)
Cooling system	12 qts. (11.4 L)
Crankcase (including filter)	6 qts. (5.7 L)
Transmission-hydraulic system	10 gals. (38 L)
Belt pulley	2-1/2 pts. (0.3 L)

CLUTCH

Single or dual stage,
spring-loaded, dry
disk, foot-operated.

TRANSMISSION

Type Collar shift
Gear selections 8 forward and 4 reverse
Shifting 4 speeds each in high, low,
and reverse ranges. Park
lock included.

HI-LO SHIFT

Hydraulic wet clutches, no clutching required.
Shifting from high to low decreases ground speed
21.4 percent and increases pull power up to 27 per-
cent in any of the transmission speeds.

REVERSER

Hydraulic wet clutches, no clutching required. Pro-
vides reverse speeds for gear selections 1 through 4
which are 16% faster than corresponding forward
speeds.

BRAKES Hydraulically actuated, wet-
disk type.

DIFFERENTIAL AND FINAL DRIVES

Type Planetary reduction final
drives with spiral bevel gear
drive differential.
Differential lock Hand or foot-operated me-
chanical lock, spring-loaded
out of engagement.

POWER TAKE-OFF

Type Continuous-running or inde-
pendent types available in
540 and/or 1000 rpm op-
tions.

HYDRAULIC SYSTEM

Type Closed center, constant pressure.
Actuates power steering and implement control.
Standby oil pressure 2250 psi (15.5 mPa)

STEERING

TYPE Hydraulically actuated, with
manual provision in case of
hydraulic failure.

FRONT TIRES (Standard Equipment)* 6.00-16

REAR TIRES (Standard Equipment)* 16.9-28

DIMENSIONS

Over-all height to top of muffler . 81.2 in. (206 cm)
Over-all height to top of hood ... 55.7 in. (141 cm)
Over-all width, min. 69.5 in. (177 cm)
Over-all length
(with 3-point hitch) 139.5 in. (354 cm)
Wheelbase (straight axle) 87.8 (218 cm)
Shipping weight (approx.) .. 4800 lbs. (2 182 kg)

*Additional tire sizes available.

GROUND SPEEDS Given in MPH (km/h) with 16.9-28 Rear Tires and 2500 Engine RPM

Gear	Collar Shift Transmission	Hi-Lo Shift Transmission		Ground Speed at Rated PTO SPEED (2100 RPM)	
		"Lo"	"Hi"	"Lo"	"Hi"
1st	1.53 (2.46)	1.20 (1.93)	1.53 (2.46)	1.01 (1.62)	1.28 (2.06)
2nd	2.18 (3.51)	1.72 (2.77)	2.18 (3.51)	1.44 (2.32)	1.83 (2.95)
3rd	3.24 (5.21)	2.55 (4.10)	3.24 (5.21)	2.14 (3.44)	2.72 (4.38)
4th	4.53 (7.28)	3.56 (5.72)	4.53 (7.28)	2.99 (4.81)	3.80 (6.12)
5th	6.00 (9.65)	4.71 (7.57)	6.00 (9.65)	3.96 (6.37)	5.04 (8.10)
6th	8.57 (13.78)	6.73 (10.82)	8.57 (13.78)	5.66 (9.09)	7.20 (11.57)
7th	12.71 (20.44)	9.99 (16.06)	12.71 (20.44)	8.39 (13.50)	10.68 (17.17)
8th	17.78 (28.59)	13.97 (22.46)	17.78 (28.59)	11.73 (18.86)	14.93 (24.01)
R1	1.78 (2.86)	1.40 (2.25)	1.78 (2.86)	1.17 (1.88)	1.49 (2.40)
R2	2.54 (4.08)	1.99 (3.20)	2.54 (4.08)	1.67 (2.69)	2.13 (3.43)
R3	3.77 (6.06)	2.96 (4.76)	3.77 (6.06)	2.48 (4.00)	3.16 (5.09)
R4	5.26 (8.46)	4.14 (6.66)	5.26 (8.46)	3.47 (5.59)	4.42 (7.11)

Group 7

10

GENERAL TRACTOR SPECIFICATIONS (2640)

ENGINE

Maximum PTO HORSEPOWER* 70.0 (52.2 kW)
Nuner of cylinders 4
Bore and stroke, inches (cm) 4.19 x 5.00
(10.65 x 12.70)
Displacement - cubic inches
(cubic centimeters) 276 (4416)
Compression ratio 16.2 to 1
Firing order 1-3-4-2
Intake valve clearance 0.014-in. (0.36 mm)
Exhaust valve clearance 0.018-in. (0.46 mm)
Slow idle 800 rpm
Fast idle 2650 rpm
Transport speed (foot throttle) 2800 rpm

ELECTRICAL SYSTEM

Battery dry voltage 12 volts
Battery specific gravity at full charge
(corrected to 80°F [27°C]) 1.260
Battery terminal grounded negative

CAPACITIES (U.S. Standard Measures)

Fuel tank 19-1/2 gals. (73.8 L)
Cooling system 12 qts. (11.4 L)
Crankcase (including filter) 9 qts. (8.5 L)
Transmission-hydraulic system 10 gals. (38 L)
Belt pulley 2-1/2 pts. (0.3 L)

CLUTCH Single or dual stage,
spring-loaded, dry
disk, foot-operated.

TRANSMISSION

Type Collar Shift
Gear selections 8 forward and 4 reverse
Shifting 4 speeds each in high, low,
and reverse ranges. Park
lock included.

HI-LO SHIFT

Hydraulic wet clutches, no clutching required.
Shifting from high to low decreases ground speed
21.4 percent and increases pull power up to 27 per-
cent in any of the transmission speeds.

*Factory observed at 2500 engine rpm (650 or 1210
PTO rpm).

REVERSER

Hydraulic wet clutches, no clutching required.
Provides reverse speeds for gear selections 1
through 4 which are 16% faster than corresponding
forward speeds.

BRAKES Hydraulically actuated, wet-
disk type.

DIFFERENTIAL AND FINAL DRIVES

Type Planetary reduction final
drives with spiral bevel gear
drive differential.
Differential lock Hand or foot-operated me-
chanical lock, spring-loaded
out of engagement.

POWER TAKE-OFF

Type Continuous-running or inde-
pendent types available in
540 or 540/1000 rpm op-
tions.

HYDRAULIC SYSTEM

Type Closed center, constant pressure.
Actuates power steering and implement control.
Standby oil pressure 2250 psi (15.5 mPa)

STEERING

TYPE Hydraulically actuated, with
manual provision in case of
hydraulic failure.

FRONT TIRES (Standard Equipment)* 6.00-16

REAR TIRES (Standard Equipment)* 16.9-28

DIMENSIONS

Over-all height to top of muffler . 81.2 in. (206 cm)
Over-all height to top of hood . 55.7 in. (141.5 cm)
Over-all width, min. 69.5 in. (176.5 cm)
Over-all length
(with 3-point hitch) 139.5 in. (354 cm)
Wheelbase (straight axle) 87.8 in. (21.8 m)
Shipping weight (approx.) ... 5100 lbs. (2313 kg)

*Additional tire sizes available.

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GROUND SPEEDS
Given in MPH (Km/h) With 16.9-28
Rear Tires and 2500 Engine RPM

Gear	Collar Shift Transmission		Hi-Lo Shift Transmission		Ground Speed at Rated PTO SPEED (2100 RPM)			
					"Lo"		"Hi"	
1st	1.56	(2.50)	1.23	(1.98)	1.56	(2.50)	1.03	(1.66)
2nd	2.23	(3.58)	1.75	(2.81)	2.23	(3.58)	1.47	(2.36)
3rd	3.30	(5.30)	2.60	(4.17)	3.30	(5.30)	2.18	(3.50)
4th	4.62	(7.41)	3.63	(5.83)	4.62	(7.41)	3.05	(4.89)
5th	5.49	(8.82)	4.32	(6.93)	5.49	(8.82)	3.63	(5.82)
6th	7.85	(12.61)	6.17	(9.91)	7.85	(12.61)	5.18	(8.32)
7th	11.64	(18.67)	9.16	(14.70)	11.64	(18.67)	7.69	(12.35)
8th	16.28	(26.14)	12.79	(20.52)	16.28	(26.14)	10.74	(17.24)
R1	1.81	(2.91)	1.42	(2.28)	1.81	(2.91)		
R2	2.59	(4.15)	2.03	(3.26)	2.59	(4.15)		
R3	3.84	(6.16)	3.02	(4.84)	3.84	(6.16)		
R4	5.37	(8.62)	4.22	(6.77)	5.37	(8.62)		

Group 10

PREDELIVERY, DELIVERY, AND AFTER-SALE SERVICES

PREDELIVERY SERVICE

Because of the shipping factors involved, plus extra finishing touches that are necessary to promote customer satisfaction, proper predelivery service is of prime importance to the dealer.

A tag pointing out the factory-recommended procedure for predelivery service is attached to each new tractor before it leaves the factory.

After completing the factory-recommended dealer checks and services listed on the predelivery tag, remove the tag from the tractor and file it with the shop order for the job. The tag will certify that the tractor has received the proper predelivery service when that portion of the customer's John Deere Delivery Receipt is completed.

Temporary Tractor Storage

Service	Specification	Reference
Check radiator for coolant loss and antifreeze protection	Midway between core and filler neck	
Remove and store batteries	Store at room temperature	
Reduce shipping pressure of tires		Operator's manual
Cover tractor and tires for protection and cleanliness		

Before Delivering Tractor

Electrical System

Remove resistor and connect wiring lead (red) to alternator output terminal. Do not attempt to polarize alternator		Section 40, Group 10
Charge batteries. Check electrolyte level and specific gravity		FOS-20 Manual
Check battery terminal connections		Section 40, Group 5
Check alternator belt tension	3/4-inch (1.9 cm) deflection, 20 lb. (104 N) force	Operator's manual
Check light operation and adjustment. Remove flasher if required by local government regulations		Operator's manual

Service

Specification

Reference

Before Delivering Tractor—Continued

Cooling System

Inspect radiator for coolant loss	Midway between core and filler neck	
Check antifreeze protection		

Tires and Wheels

Adjust pressure of tires		Operator's manual
Check front wheel hub bolts, rear wheel rim clamp nuts, and rear wheel cap screws for tightness	Front hub bolts-100 ft-lbs (135 Nm) torque Rear hub bolts-300 ft-lbs (407 Nm) torque Rim clamp nuts-170 ft-lbs (230 Nm) torque Rear wheel-to-flanged axle— 130 ft-lbs (176 Nm) torque	Operator's manual

Lubrication

Check crankcase oil level	To upper marks on dipstick	Operator's manual
Check transmission-hydraulic system oil level	To top of "SAFE" range on dip- stick. Hy-GARD Oil	Operator's manual
Lubricate grease fittings	John Deere Multi-purpose Lubricant	Operator's manual
Check belt pulley oil level (if so equipped)		Operator's manual

Engine

Check air intake system—air cleaner and hose connections		Operator's manual
Drain sediment from fuel filter		Operator's manual
Fill fuel tank and start engine	19-1/2 U.S. gallons (73.8 liters)	Operator's manual
Check operation of starter, alternator, flashers, gauges, and indicator lights		Operator's manual
Check engine timing	TDC	Operator's manual
Check speed control and fuel shut-off linkages for free operation and adjustment		Section 30, Group 20

Service	Specification	Reference
Before Delivering Tractor—Continued		
Check engine speeds	Slow idle, 800 rpm High idle, 2650 rpm Foot throttle, 2800 rpm	Section 30, Group 20
Operation		
Check transmission clutch free travel (tractors without reverser)	Approximately 1-inch (2.54 cm) free pedal travel	Operator's manual
Check clutch wear adjustment (tractors with reverser)	5-1/4 in. (13.34 cm) from engine flange	Operator's manual
Shift transmission through all speeds		Operator's manual
Check power takeoff operation		Operator's manual
Check differential lock operation		Operator's manual
Check steering operation		Operator's manual
Check brakes	Bleed brakes if spongy, check for excessive pedal travel, and even position	Operator's manual
Check hydraulic system operation: Rockshaft, and remote cylinder		Operator's manual
Check 3-point hitch operation		Operator's manual
Check negative stop screw adjustment		
Tractors without independent PTO	1/4 turn	Section 70, Group 30
Tractors with Independent PTO	1/3 turn	Section 70, Group 30
Check operation of reverser, or Hi-Lo Shift		Operator's manual
Check seat operation		Operator's manual
General		
Check Roll-Gard Mounting bolts for correct torque	300 ft-lbs (407 Nm)	Section 10, Group 30
Check front axle-to-knee bolts for correct torque	300 ft-lbs (407 Nm)	Section 80, Group 5

10 Before Delivering Tractor—Continued

Service	Specifications	Source
Tighten accessible nuts and cap screws		
Clean tractor and touch up paint		
Remove covering from SCV emblem		

DELIVERY SERVICE

A thorough discussion of the operation and service of a new tractor at the time of delivery helps to assure complete customer satisfaction. Proper delivery should be an important phase of a dealer's program. A portion of the John Deere Delivery Receipt emphasizes the importance of proper delivery service.

It is a well-known fact that many complaints have arisen simply because the owner was not shown how to operate and service the new tractor properly. Enough time should be devoted, at the customer's convenience, to introducing the new tractor to the owner and explaining how to operate and service it.

The following procedure is recommended before the service technician and owner complete the delivery acknowledgments portion of the delivery receipt.

Using the tractor operator's manual as a guide, be sure that the owner understands these points thoroughly:

1. Controls and Instruments.
2. How to start and stop the engine.
3. The importance of the break-in period.
4. How to use liquid or cast-iron ballast.
5. all functions of the hydraulic system.
6. Using the power takeoff and belt pulley.
7. The importance of safety.
8. The importance of lubrication and periodic services

After explaining and demonstrating the above features, have the owner sign the delivery receipt and give the operator's manual to the owner.

AFTER-SALE INSPECTION

The purchaser of a new John Deere tractor is entitled to a free inspection within the warranty period after the equipment has been "run in." The terms of this after-sale inspection are outlined on the back of the John Deere Delivery Receipt.

The purpose of this inspection is to make sure that the customer is receiving satisfactory performance from the tractor. At the same time, the inspection should reveal whether or not the tractor is being operated, lubricated, and serviced properly.

If the recommended after-sale service inspection is followed, the dealer can eliminate a needless volume of service work by preventing minor irregularities from developing into serious problems later on. This will promote strong dealer-customer relations and present the dealer an opportunity to answer questions that may have arisen during the first few days of operation. During the inspection service, the dealer has the further opportunity of promoting the possible sale of other new equipment.

The following inspection program is recommended within the first 100 hours of tractor operation.

Inspection Procedure

Service	Specification	Reference
Cooling System		
Check radiator coolant level	Midway between core and filler neck	

Inspection Procedure—Continued

Service	Specification	Reference
Clean external surface of radiator core		
Check hoses and connections for leaks		
Fuel System		
Remove water and foreign matter from filter sediment bowl		Operator's manual
Bleed fuel system		Operator's manual
Tighten loose connections and check entire system for leaks. Correct if necessary		
Check air cleaner element and unloading valve. Clean element if necessary		Operator's manual
Electrical System		
Check specific gravity of battery(s)	Full charge - 1.260 at 80°F (27°C) ..	Operator's manual
Check level of battery electrolyte	To bottom of filler neck in each cell	Operator's manual
Check belt tension	3/4-inch (19.1 mm) deflection with a 20 lb. (104 N) force	Operator's manual
Start engine and check operation of starter, lights, and indicator lamps		Operator's manual
Lubrication		
Check crankcase oil level	To upper marks on dipstick	Operator's manual
Check transmission-hydraulic system oil level	In "SAFE" range on dipstick. Use John Deere Hy-GARD	Operator's manual
Engine		
Check valve clearance (static)	Intake: 0.014 in. (0.35 mm) Exhaust: 0.018 in. (0.46 mm)	Operator's manual

10 Inspection Procedure—Continued

Service	Specification	Reference
Check engine speed (under load), and horsepower	Specification	Group 15 of this Section.

Operation

Check transmission clutch free travel (tractors without reverser)	Approximately 1-inch (2.54 cm) free pedal travel	Operator's manual
Check clutch wear adjustment (tractors with reverser)	5-1/4 in. (13.34 cm) from pedal to rear of engine flange	Operator's manual
Shift transmission through all speeds		Operator's manual
Check Reverser, Hi-Lo operation		Operator's manual
Check Power Take-Off operation		Section 50, Groups 35, 40 and 42
Check differential lock operation		Operator's manual
Check rockshaft and remote cylinder operation		Section 70, Group 30
Check negative stop screw adjustment		
Tractors without Independent PTO	1/4 turn	Section 70, Group 30
Tractors with Independent PTO	1/3 turn	Section 70, Group 30
Check steering system operation	Smooth, without excessive freeplay	Section 70, Group 20
Check brakes	Bleed brakes if spongy, check for excessive pedal travel, and even position	Section 70, Group 25

Nuts and Cap Screws

Tighten accessible nuts and cap screws that require adjustment	
--	--

Group 15 TUNE-UP

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GENERAL INFORMATION

Before tuning up a tractor, determine whether a tune-up will restore operating efficiency. When there is doubt, the following preliminary tests will help to determine if the engine can be tuned-up.

If the condition is satisfactory, proceed with the tune-up. Choose from the following procedures only those necessary to restore the unit.

Preliminary Engine Testing

Operation	Specification	Section-Group Reference
Dynamometer Test (at 2500 engine rpm, full load—650 or 1210 PTO rpm)	Compare with previous recorded output; compare with output after tune-up	FOS 30 Manual, Chapter 12
Compression Test	300 psi (2067 kPa) at full cranking speed	FOS 30 Manual
Engine Coolant Check Test	No air bubbles or oil film in radiator	FOS 30 Manual, Chapter 12

Engine Tune-Up

Operation	Specification	Section-Group Reference
Air Intake System		
Service air cleaner and check system for leaks		FOS 30 Manual, Chapter 12
Check system for restrictions using water manometer		
Normal reading with clean filter element (inches of water)	3-12 inches (8.89 cm)	FOS 30 Manual, Chapter 12
Maximum permitted reading	25 in. (63.5 cm) at 2500 rpm (full load)	FOS 30 Manual, Chapter 12
Exhaust System		
Check system for leaks		FOS 30 Manual, Chapter 12
Check muffler and exhaust pipe for restrictions		FOS 30 Manual, Chapter 12

10 Engine Tune-Up—Continued

Operation	Specification	Section-Group Reference	
		(2440)	(2640)
Crankcase Ventilating System			
Check system for restrictions		FOS 30 Manual, Chapter 12	
Cooling System			
Clean grille screen, radiator core, and oil cooler core		20-35	20-35
Clean and flush system; check thermostat opening temperature, if necessary		20-35	20-35
Check pressure cap	6.25 to 7.50 psi (43 to 52 kPa)		
	release pressure	20-35	20-35
Cylinder Head and Valves			
Torque cylinder head cap screws	110 ft-lbs (149 Nm) in sequence	20-10	20-12
Set valve clearance	Intake-0.014 inch (0.36 mm)		
	Exhaust-0.018 inch (0.46 mm)	20-10	20-12
Fuel System			
Check fuel tank for water or other foreign material			
Check fuel pump pressure	3-1/2 to 4-1/2 psi (24 to 31 kPa) ..	30-15	30-15
Change filter		30-15	30-15
Injection Pump:			
Service and check timing	TDC	30-15	30-15
	4° advance at 1100 rpm (2440) and 1200 rpm (2640) (no load)	30-15	30-15
Adjust speed control linkage	Foot throttle - 2800 rpm		
	Hand throttle		
	High idle - 2650 rpm		
	Slow idle - 800 rpm	30-20	30-20
Lubrication System			
Check engine oil pressure	45 to 65 psi (317 to 448 kPa)		
	at high idle	20-30	20-32
Charging System			
Check battery specific gravity	1.240 to 1.260	40-10	40-10
Check battery water consumption and electrolyte level		40-10	40-10
Clean battery, cables, and box		40-10	40-10
Check alternator belt tension	20 lb. (104 N) with 3/4 in. (19.1 mm) belt deflection	40-10	40-10
Check alternator output	25 amps at 13 to 15 volts (2052 engine rpm, 3000 alternator rpm) ..	40-10	40-10
Check alternator regulated voltage	13.8 to 14.3 volts (operating)	40-10	40-10
Starting System			
Check neutral start switch operation			
Check battery voltage when starting	Min. 9 volts (cranking)	40-15	40-15
Check starter current draw	Approx. 400 amps	40-15	40-15
Check operation of alternator and oil pressure indicator lights		40-25	40-25

Final Engine Test

Operation	Specification	Section-Group Reference
Dynamometer	Compare with previous recorded output. Record for future use.	FOS 30 Manual, Chapter 12

Tractor Tune-Up

Operation	Specification	Section-Group Reference (2440)	Section-Group Reference (2640)
Adjust transmission clutch pedal free travel			
Tractors without reverser	1 inch (2.54 cm)	50-5	50-5
Tractors with reverser	5-1/4 inches (13.34 cm) from rear of engine flange	50-5	50-5
Check transmission shifting		50-20	50-20
Check transmission for proper operation without excessive noise		50-20	50-20
Check Hi-Lo reverser operation		50-10&15	50-10&15
Check power take off for proper operation		50-35&40	50-35&42
Check differential lock operation		50-25	50-25
Check brake pedal travel and position	Bleed brakes if spongy	70-25	70-25
Check front wheel bearing adjustment and lubrication	35 ft-lbs (47 Nm) torque; back off to nearest hole		
Check front wheel toe-in	1/8 to 3/8 in. (3.2 to 9.5 mm)		
Check tire inflation	See operator's manual		
Transmission pump	6 gpm (0.38 l/s) at 2500 rpm	70-15	70-15
Main hydraulic pump	2200 to 2300 psi (15.2 to 15.8 mPa) standby; 13 gpm (0.82 l/s) or 23 gpm (1.45 l/s)	70-15	70-15
Pressure control valve	1700 to 1800 psi (11.7 to 12.4 mPa) at 1900 engine rpm	70-10	70-10
Rockshaft lift cycle time (60 degrees rotation)	1.5 to 1.6 seconds at 2100 rpm	70-30	70-30
Check selective control valve and remove cylinder cycle time	Remote cylinder (2.5 x 8 in. [6.35 x 14.35 cm] extends in 1.5 to 2.0 sec. ...	70-35	70-35

Hydraulic system pressures and flow rates are for conditions specified in Section 70 (tractor at operating temperature, transmission-hydraulic oil at correct temperature, proper test equipment, correct test sequence, etc.)

Group 20 LUBRICATION

10

GENERAL INFORMATION

Carefully written and illustrated lubrication instructions are included in the operator's manual furnished with your customer's machine. Remind the customer to follow these instructions.

For your convenience, the following chart shows capacities and types of lubricants for the tractor components and systems. Specifications for lubricants follow the chart.

Item	Capacity	Type of Lubricant	Interval of Service
Engine crankcase	6 U.S. quarts (5.7 l) (2440) 9 U.S. quarts (8.5 l) (2640) (in- cluding filter)	See page 20-2	10 Hours—Check 100 Hours—Drain and re- fill. 200 Hours—Change filter
Transmission and hy- draulic system	10 U.S. gals. (37.85 l)	Hy-GARD Oil (or its equivalent)	50 Hours—Check 50 Hours—Change filter (end of initial break-in) 500 Hours—Change filter 1000 Hours—Drain and re- fill. Clean screen.
Belt pulley	2-1/2 pts. (1.18 l)	Hy-GARD Oil (or its equivalent) or SAE 80 multipurpose lubricant	200 Hours—Check 500 Hours—Drain, flush and refill
Grease fittings	John Deere Multi- Purpose Lubricant or its equivalent	See Operator's Manual
Starter	Saturate wicks	SAE 10W engine crankcase oil	1000 Hours
	Lubricate armature shaft splines during assembly	SAE 10W engine crankcase oil

LUBRICANTS

Engine Lubricating Oils



X3377N

We recommend John Deere Torq-Gard Supreme Engine Oil for use in the engine crankcase. Torq-Gard Supreme is compounded specifically for use in John Deere engines and provides superior lubrication under all conditions. NEVER PUT ADDITIVES IN THE CRANKCASE. Torq-Gard Supreme Oil was formulated to provide all the protection your engine needs. Additives could reduce this protection rather than help it.

If Torq-Gard Supreme is not used, use an engine oil that conforms to one of the following specifications:

SINGLE VISCOSITY OILS

API Service CD/SD
MIL-L-2104C
Series 3*

MULTI-VISCOSITY OILS

API Service CC/SE, CC/SD, or SD
MIL-L-46152

**As further assurance of quality, the oil should also be identified as suitable for API service designation SD.*

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

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

Air Temperature	John Deere Torq-Gard Oil	Other Oils	
		Single Vis-cosity Oil	Multi-Vis-cosity Oil
Above 32°F (0°C)	SAE 30	SAE 30	Not recommended
-10°F to 32°F (-19°C to 0°C)**	SAE 10W-20	SAE 10W	SAE 10W-30
Below -10°F (-19°C)	SAE 5W-20	SAE 5W	SAE 5W-20

***SAE 5W-20 oil may be used where required to insure optimum lubrication at starting, particularly for an engine subjected to -10°F (-19°C) or lower for several hours.*

Transmission Hydraulic Oils

Use only John Deere Hy-GARD Transmission and Hydraulic Oil or its equivalent in the transmission hydraulic system. Other types of oil will not give satisfactory service and may result in eventual damage. This special oil, available from your John Deere dealer, may be used in all weather conditions.

NOTE: John Deere Hy-GARD Transmission and Hydraulic Oil may be added to or mixed with John Deere Type 303 Special-Purpose Oil.

Greases

John Deere Multi-Purpose Lubricant or an equivalent SAE Multipurpose-type grease is recommended for grease fittings. Application of grease as instructed in the lubrication section of the Operator's Manual will provide proper lubrication and will keep contamination out of bearings.

Storing Lubricants

A tractor can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination.

Group 25 SEPARATION (2440)

10

SEPARATING TRACTOR FRONT END FROM ENGINE

Remove battery door from cowling. Remove right-hand or left-hand cowl. Disconnect negative battery cable from both batteries.

Remove side grille screen, muffler, hood, and front ballast (if so equipped).

Drain cooling system. Shut off fuel at fuel cock underneath fuel tank.

Wedge a block on each side between the front support and the axle.

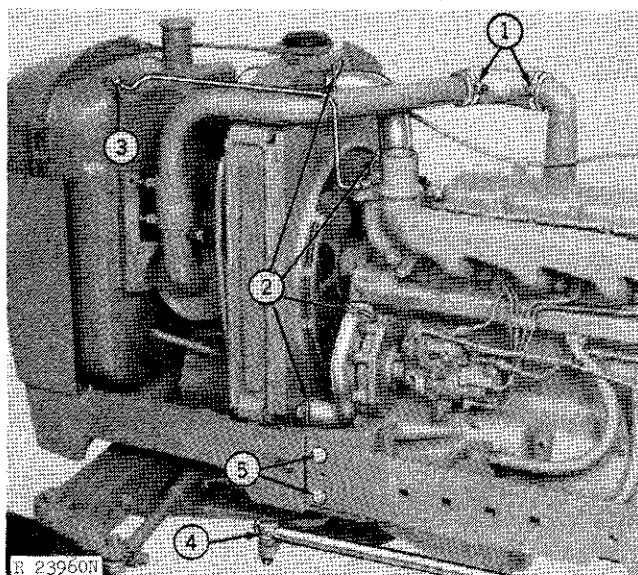


Fig. 1-Left-Hand Removal Procedures

Refer to Fig. 1 for left-hand removal procedures.

1. Remove air intake hose from air intake pipe.
2. Remove upper and lower radiator hoses.
3. Disconnect the fuel leak-off pipe.
4. Disconnect front end of drag link from steering mechanism.

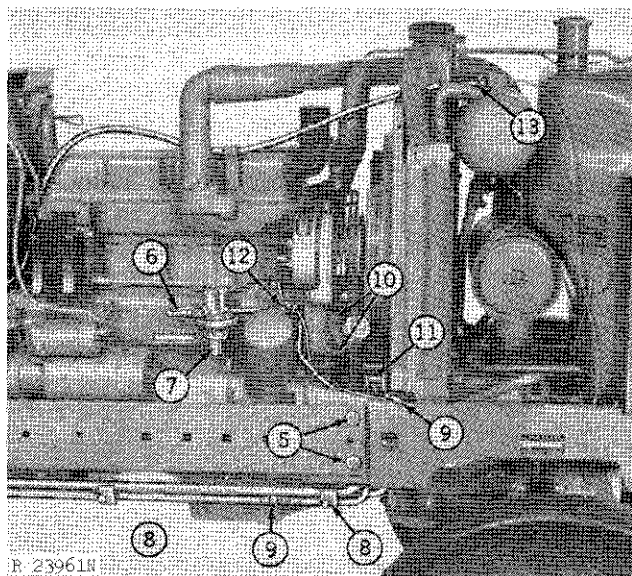


Fig. 2-Right-Hand Removal Procedure

Refer to Fig. 2 for right-hand removal procedures.

5. Remove tool box (if so equipped). Remove side frames from tractor.
6. Remove fuel inlet line from fuel pump.
7. Remove fuel pump from engine block.
8. Remove hydraulic oil pipe clamps from pipes.
9. Disconnect hydraulic oil lines underneath and directly behind the radiator. Disconnect hydraulic pump pressure pipe at connector.
10. Remove oil filler spout from front of engine block.
11. Disconnect and remove hydraulic pump drive coupling.
12. Disconnect fuel tank indicator wire.
13. Disconnect hydraulic reservoir vent hose and remove it from underneath the foam insulation piece.

Install JDG-9 in side frame holes of front support (Fig. 3). Adjust stand to be tight against floor.

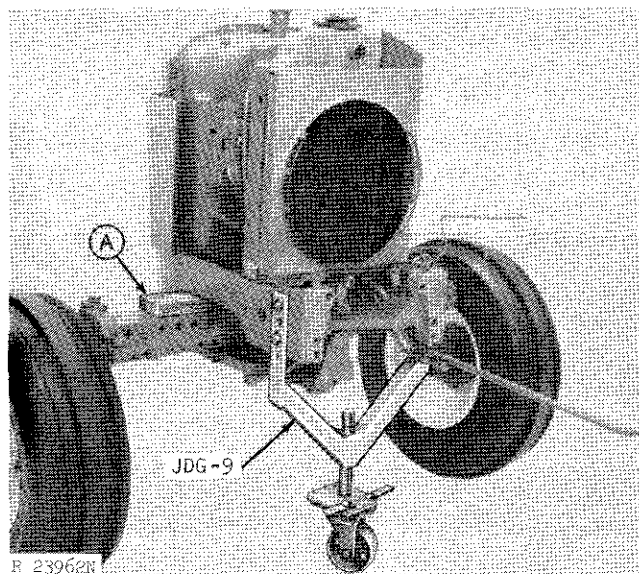
10 SEPARATING TRACTOR FRONT END FROM ENGINE—Continued

NOTE: A hydraulic pump check valve is located in clutch housing pump inlet pipe bore. Do not lose these parts.

CAUTION: Place a hydraulic floor jack or floor support under clutch housing or transmission case. Be sure wooden blocks are positioned between front support and front axle before separation is made. Tractor will roll sideways without blocks.

Install JD-244 Lifting Eyes on engine. Using an overhead hoist, attach JDG-1 Engine Lift Sling to JD-244 Lifting Eyes to support engine (Fig. 12).

Remove the six engine-to-front support cap screws.



A—Block of Wood

Fig. 3—Front End Separated from Engine

Carefully separate tractor front end by rolling rear section away from front end (Fig. 3). Place a metal stand under clutch housing. Install caplugs.

ASSEMBLY

IMPORTANT: Be sure hydraulic pump check valve (tractors without Hi-Lo or reverser) is installed in the pump inlet pipe before joining sections. Remove caplugs.

Join sections. Tighten bolts and cap screws to specified torque (Section 10, page 30-1). Remove JDG-1 Lift Sling, and JD-244 Lifting Eyes.

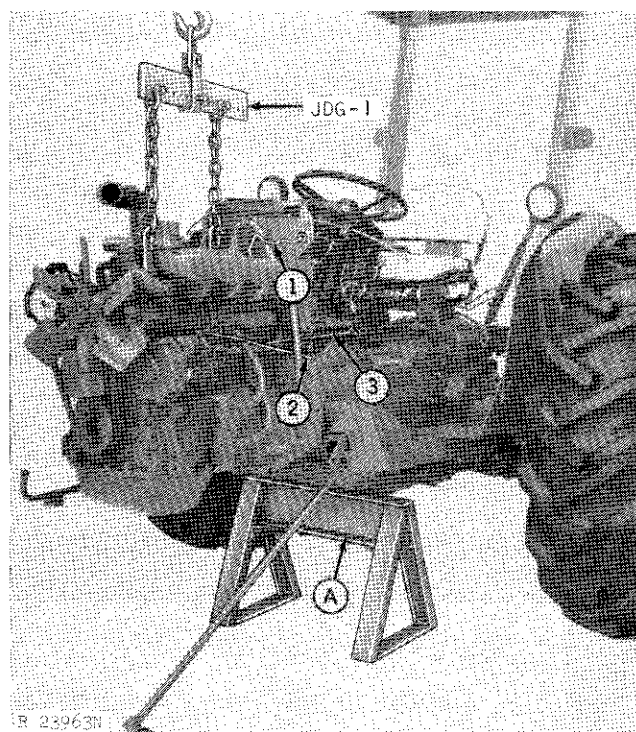
Reverse the numbered removal steps. Use new gaskets on oil filler spout (step 10) and fuel pump (step 7).

Install battery, side grille screens, hood, muffler, and front ballast (if used). Fill cooling system.

Start engine and check operation.

REMOVING ENGINE

Remove the front end from tractor as explained in SEPARATING TRACTOR FRONT END FROM ENGINE.



A—Support Stand

Fig. 4—Left-Hand Removal Procedure

1. Disconnect temperature gauge sensing bulb from engine.
2. Disconnect speed control rod.
3. Disconnect and remove fuel shut-off rod.

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