



4620 Tractor

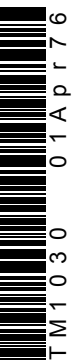


TECHNICAL MANUAL 4620 Tractor

TM1030 (01Apr76) English

TM1030 (01Apr76)

LITHO IN U.S.A.
ENGLISH



4620 TRACTOR**TECHNICAL MANUAL
TM-1030 (APR-76)****CONTENTS****SECTION 10 - GENERAL**

- Group 5 - Specifications
- Group 10 - Predelivery, Delivery, and After-Sale Services
- Group 15 - Tune-Up
- Group 20 - Lubrication
- Group 25 - Separation

SECTION 20 - ENGINE

- Group 5 - General Information, Diagnosis, and Tests
- Group 10 - Cylinder Head, Valve Train, and Camshaft
- Group 15 - Cylinder Block, Liners, Pistons, and Rods
- Group 20 - Crankshaft, Main Bearings, and Flywheel
- Group 25 - Lubrication System
- Group 30 - Cooling System

SECTION 30 - FUEL SYSTEM

- Group 5 - Diagnosing Malfunctions
- Group 10 - Air Intake System
- Group 15 - Fuel Injection System
- Group 20 - Speed Control Linkage

SECTION 40 - ELECTRICAL SYSTEM

- Group 5 - Information and Wiring Diagrams
- Group 10 - Motorola Charging Circuit
- Group 12 - Delcotron Charging Circuit
- Group 15 - Delco-Remy Starting Circuit
- Group 17 - John Deere Starting Circuit
- Group 20 - Lighting and Accessory Circuits

SECTION 50 - POWER TRAIN

- Group 5 - Syncro-Range Transmission and PTO Clutches
- Group 10 - Syncro-Range Transmission
- Group 15 - Engine Disconnect Clutch
- Group 20 - Power Shift Transmission
- Group 25 - Differential
- Group 30 - Final Drive
- Group 35 - Syncro-Range PTO
- Group 40 - Power Shift PTO
- Group 45 - Power Front-Wheel Drive

SECTION 60 - STEERING AND BRAKES

- Group 5 - General Information

SECTION 70 - HYDRAULIC SYSTEM

- Group 5 - General Information, Diagnosis, and Tests
- Group 10 - Main Reservoir, Filters, Valves, Oil Cooler, and Oil Reservoir
- Group 15 - Hydraulic Pumps
- Group 20 - Power Steering
- Group 25 - Power Brakes
- Group 30 - Rockshaft and Implement Hitches
- Group 35 - Selective Control Valve, Breakaway Couplers, and Remote Cylinders

SECTION 80 - MISCELLANEOUS

- Group 5 - Conventional Front Axle
- Group 10 - Power Front-Wheel Drive Axle

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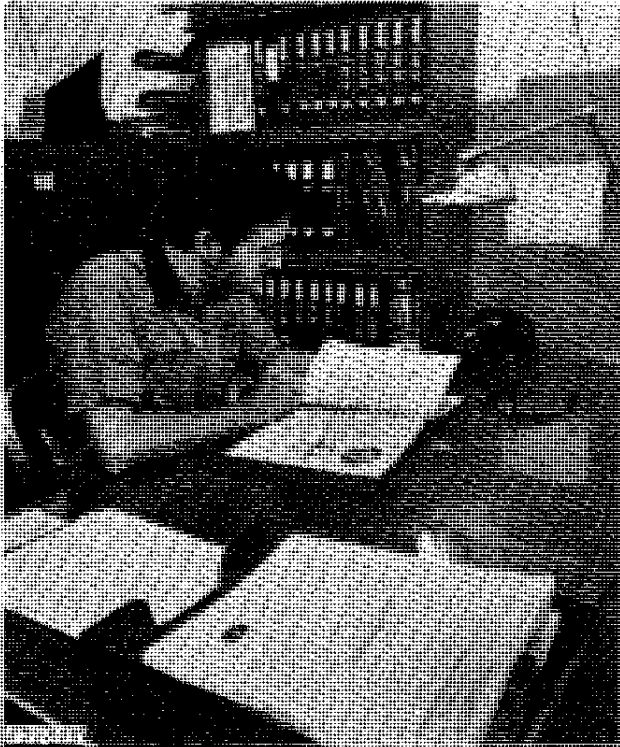
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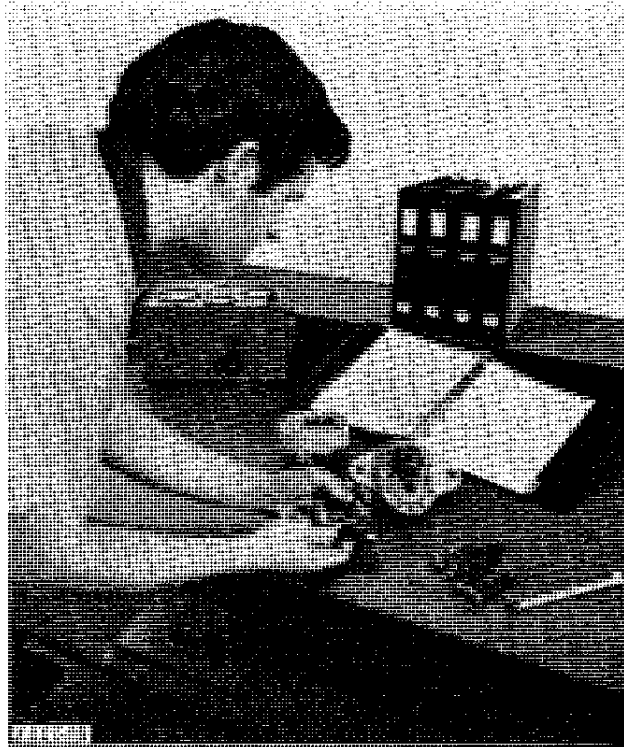
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INTRODUCTION



Use FOS Manuals for Reference



Use Technical Manuals for Actual Service

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.

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

CONTENTS OF THIS SECTION

	Page		Page
GROUP 5 - SPECIFICATIONS		GROUP 20 - LUBRICATION (Cont.)	
General Tractor Specifications	5-1	Greases	20-1
GROUP 10 - PREDELIVERY, DELIVERY, AND AFTER-SALE SERVICES		Storing Lubricants	20-2
Predelivery Services	10-1	GROUP 25 - SEPARATION	
Delivery Services	10-3	Removing Roll-Gard Cab	25-1
After-Sale Services	10-4	Installing Roll-Gard Cab	25-2
GROUP 15 - TUNE-UP		Separating Engine from Clutch Housing	25-2
Preliminary Engine Testing	15-1	Separating Clutch Housing from Power Shift Transmission	25-3
Engine Tune-Up	15-1	Separating Clutch Housing from Synco-Range transmission	25-5
Engine Final Testing	15-2	Removing Engine	25-7
Tractor Tune-Up	15-3	Separating Engine from Front End	25-7
GROUP 20 - LUBRICATION		Removing Final Drive Assembly	25-8
Lubrication Chart	20-1	Specifications	25-9
Engine Lubricating Oils	20-2	Torques for Hardware	25-9
Transmission-Hydraulic Oil	20-2	Special Tools	25-9

Group 5 GENERAL TRACTOR SPECIFICATIONS

HORSEPOWER:*

 Syncro-Range

 Power Shift

ENGINE:

 Type

 Bore and stroke

 Displacement

 Compression ratio

 Firing order

 Valve clearance

 Injection pump timing

 Engine Speeds:

 Working range

 Maximum transport speed

 Engine speeds:

 Slow idle

 1900 rpm load

 2200 rpm load

 2500 rpm load

LUBRICATION SYSTEM:

FUEL SYSTEM:

 Type

 Filter

 Injection pump type

 Air cleaner

COOLING SYSTEM:

 Type

 Temperature control

CAPACITIES:

 Fuel tank

 Cooling system

 Crankcase (with filter change)

 Transmission-hydraulic system (add 4-1/2
 gals. to capacity if equipped with Power Front
 -Wheel Drive):

 Syncro-Range Transmission

 Power Shift Transmission

SYNCRO-RANGE TRANSMISSION:

 Type

 Clutch

 Gear selections

 Shifting

* *Factory observed hp. measured at the PTO at 2200 engine rpm*
Litho in U.S.A.

POWER SHIFT TRANSMISSION:

Type Planetary gears, hydraulically actuated wet disk clutches and brakes
Gear selections 8 forward and 4 reverse
Shifting Hydraulic, powershifting controlled by speed selector

POWER TAKE-OFF:

Type Independent rear power take-off controlled by hand-operated clutch lever

Clutch:

Syncro-Range One dry-disk, hydraulically actuated

Power Shift Multiple disk, wet clutch hydraulically actuated

Speed (1900 engine rpm) 1000 rpm

PTO ahead of drawbar hitch point 16 in.

HYDRAULIC SYSTEM:

Type Closed center, constant pressure. Includes power steering, power brakes, implement control, and transmission and differential lubrication.

Standby pressure 2250 psi

BRAKES Hydraulically power actuated, disk-type operating in oil
Provision for manual operation with brake accumulator to supply oil.

STEERING Full power, hydrostatic type.
Provision for manual operation.

ELECTRICAL SYSTEM:

Type 12-volt, negative grounded

Batteries Two, 6-volt, 75-plate 172-ampere-hour, 3 EH type, connected in series

Alternator 12-volt, 55-amp, with integral transistorized regulator.
Air conditioned tractors have 12-volt, 72-amp capacity.

FRONT TIRES* 10.00-16, 6-ply
14.9-24, 6-ply

REAR TIRES* 20.8-38, 10-ply

* Additional tire sizes available.

FRONT WHEEL TREAD:

10.00-16 tire 57-1/2 to 83-1/4 in.

14.9-24 tire 72 to 88 in.

REAR WHEEL TREAD:

20.8-38 tire, regular axle 63 to 107-1/2 in.

GROUND SPEEDS IN MILES PER HOUR (2200 engine rpm and with 20.8-38 rear tires):

Gear	Syncro-Range	Power Shift
1st	2.0	1.7
2nd	3.1	2.5
3rd	4.1	3.8
4th	5.3	5.0
5th	6.6	6.5
6th	8.7	8.5
7th	11.2	10.9
8th	18.3	18.5
1st reverse	4.0	2.1
2nd reverse	6.4	3.0
3rd reverse		4.7
4th reverse		6.3

POWER FRONT-WHEEL DRIVE

Type Hydraulic motor driven with planetary gear reduction in wheel hub, uses pressure oil from hydraulic system

Torque Low (series connected) and high (parallel connected)

Controls Solenoid operated control valves, synchronized with transmission controls

Planetary disconnect Hydraulic wet brake on ring gear releases when drive is disengaged

DIMENSIONS:

Wheelbase (Subtract 1 inch for tractors equipped with Power Front-

Wheel Drive) 106-1/4 in.

Over-all length 170-3/4 in.

Over-all height 106 in.

Height to steering wheel 87 in.

Over-all width 95-7/8 in.

Turning radius

Without Power Front-Wheel Drive

(minimum tread and brakes

applied) 151 in.

Power Front-Wheel Drive (with

drive engaged in "High Torque",

brakes applied and minimum

wheel tread) 137 in.

SHIPPING WEIGHT (With equipment for average

field service, less fuel and ballast) 13,030 lbs.

Subtract 50 lbs. if equipped with Syncro-Range transmission. Add 575 lbs. if equipped with Roll Gard. Add 1,000 lbs. for Power Front Wheel Drive.

(Specifications and design subject to change without notice.)

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.

NOTE: A Caplug is placed in the muffler outlet to prevent turbocharger rotation during transit. Remove

Caplug before unloading tractor. Reinstall Caplug before transporting the tractor to the customer.

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	2 inches above baffle.	.....
Reduce shipping pressure of tires.	.....	Operator's manual
Cover tractor and tires for protection and cleanliness .....	.....	.....

Before Delivering Tractor

<u>Electrical System</u>		
Install electrolyte and charge batteries .....	.....	FOS-20 Manual
Stamp date code on battery .....	.....	FOS-20 Manual
Connect alternator. Do not attempt to polarize .....	.....	Section 40, Group 10
Connect Power Front-Wheel Drive wiring harness at connector near control valves .....	.....	Section 40, Group 5
Install light switch knob .....	.....	.....
Clean terminals and connect battery cables .....	.....	Section 40, Group 5

Before Delivering Tractor—Continued

Service	Specification	Reference
<u>Cooling System</u>		
Inspect radiator for coolant loss	2 inches above baffle	.....
Check antifreeze protection .....	.....	.....
<u>Tires and Wheels</u>		
Adjust pressure of tires .....	.....	Operator's manual
Check front wheel hub bolts, rear wheel rim clamp nuts, and rear wheel retainer cap screws for tightness	Front hub bolts - 100 ft-lbs Rear hub bolts - 300 ft-lbs Rim clamp nuts - 170 ft-lbs	.....
<u>Lubrication</u>		
Check crankcase oil level	To upper marks on dipstick.	Operator's manual
Check transmission-hydraulic system oil level	To top of "SAFE" range on dipstick. Type 303 Special-Purpose Oil.	Operator's manual
Lubricate grease fittings	SAE multipurpose-type grease.	Operator's manual
<u>Engine</u>		
Check air cleaner .....	.....	Operator's manual
Fill fuel tank and start engine	Capacity - 50 U.S. gallons	Operator's manual
Check operation of starter, alternator, gauges, and indicator lights .....	.....	Operator's manual
Check engine timing	TDC	Section 30, Group 10
Check engine speeds	800 rpm, slow idle speed 2650 rpm idle speed, 2500 max. transport speed	Section 30, Group 10
<u>Operation</u>		
Check transmission clutch free travel (Synchro-Range transmission)	Approximately 1-1/2-inch free travel (at least 3/4 in.).	Operator's manual
Check engine disconnect clutch (Power Shift transmission)	No tendency for tractor to creep with disconnect clutch disengaged.	Section 50, Group 15
Shift transmission through all speeds .....	.....	Operator's manual

Before Delivering Tractor—Continued

Service	Specification	Reference
Check throttle linkage for free operation		Section 30, Group 10
Adjust headlights. Check operation of all lamps.		Operator's manual
Check Power Front-Wheel Drive operation		Operator's manual
Check power takeoff operation		Operator's manual
Check differential lock operation		Operator's manual
Check brakes and accumulator.	3 in. maximum travel for one emergency application immediately after stopping engine.	Operator's manual
Check hydraulic system operation: Rockshaft, steering, and remote cylinder		Operator's manual
Check implement hitch operation		Operator's manual
Check cab controls and seat operation.		Operator's manual
General		
Tighten accessible nuts and cap screws . . . . .		.....
Clean tractor and touch up paint . . . . .		.....

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.

Many complaints have arisen simply because the owner was not shown how to operate and service his new tractor properly. Enough time should be devoted, at the customer's convenience, to introducing the owner to his new tractor and explaining to him how to operate and service it.

IMPORTANT: Install Caplug in muffler outlet if transporting tractor to customer. This will prevent damage to the turbocharger caused by air passing through the turbocharger and rotating it without lubrication when the engine is stopped.

The following procedure is recommended before the serviceman 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.
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 him the operator's manual.

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 his 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	2 inches above baffle	.....
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.	Operator's manual
Check level of battery electrolyte	To bottom of filler neck in each cell.	Operator's manual
Check fan belt tension	1-inch deflection with a 25-pound force. Tractors with air conditioning, adjust belt 1-inch deflection, 20-pound force.	Operator's manual




Inspection Procedures—Continued

Service	Specification	Reference
Start engine and check operation of starter, lights, indicator lamps, and cab controls.		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 Type 303 Special-Purpose Oil.	Operator's manual
Engine		
Check valve clearance	Intake - 0.018 inch Exhaust - 0.028 inch	Operator's manual
Check engine speed under load, fuel consumption, and horsepower	Specification.	Group 15 of this Section.
Clutches and Differential Lock		
Check transmission clutch free travel (Syncro-Range transmission)	Approximately 1-1/2 inch free travel.	Operator's manual
Check engine disconnect clutch (Power Shift transmission)	No tendency for tractor to creep with disconnect clutch disengaged.	Section 50, Group 15
Shift transmission through all speeds		Operator's manual
Check Power Front-Wheel Drive operation		Operator's manual
Check PTO clutch and brake operation		Section 50, Groups 35 & 40
Check differential lock operation		Operator's manual

Inspection Procedures—Continued

Service	Specification	Reference
<u>Hydraulic System</u>		
Check rockshaft and remote cylinder operation		Section 70, Group 30
3-point hitch negative stop adjustment	1/8th turn back out after contacting transmission case.	Section 70, Group 30
Check power steering	Smooth, easy operation.	Section 70, Group 20
Check brakes and accumulator	3 in. maximum travel for one emergency application immediately after stopping engine.	Operator's manual
<u>Nuts and Cap Screws</u>		
Tighten accessible nuts and cap screws that seem to require adjustment .....		.....

RECOMMENDED TORQUE IN FOOT-POUNDS

Bolt Diameter	 Plain Head*	 Three Radial Dashes*	 Six Radial Dashes*
1/4	6	10	14
5/16	13	20	30
3/8	23	35	50
7/16	35	55	80
1/2	55	85	120
9/16	75	130	175
5/8	105	170	240
3/4	185	300	425
7/8	160	445	685
1	250	670	1030

* The types of bolts and cap screws are identified by head markings as follows:

Plain Head: regular machine bolts and cap screws.

3-Dash Head: tempered steel high-strength bolts and cap screws.

6-Dash Head: tempered steel extra high-strength bolts and cap screws.

Group 15

TUNE-UP

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 condi-

tion 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 2200 engine rpm)	Compare with previous recorded output; compare with output after tune-up.	FOS - 30 Manual, Chapter 12
Compression Test	450 psi at 130 rpm	FOS - 30 Manual, Chapter 12
Vapor Flow Test (average engine condition and without turbo-charger blowby)	Normal blowby - 120-150 cu. ft./hr. Excessive blowby - 200 cu. ft./hr.	FOS - 30 Manual, Chapter 12
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 . . . . .	. . . . .	FOS - 30 Manual, Chapter 12
Normal reading (with clean filter elements)	11 in. of water at 2200 rpm	. . . . .
Maximum permitted reading	25 in. of water at 2200 rpm	. . . . .
Check restriction indicator light operation	24-26 in. of water	. . . . .
Check manifold pressure	14.2-17.3 psi	. . . . .
Exhaust System Check system for leaks . . . . .	. . . . .	FOS - 30 Manual, Chapter 12
Check muffler and exhaust pipe for restrictions . . . . .	. . . . .	FOS - 30 Manual, Chapter 12

Engine Tune-Up—Continued

Operation	Specification	Section-Group Reference
Crankcase Ventilating System Check system for restrictions	.....	FOS - 30 Manual, Chapter 12
Cooling System Clean grille screen, radiator core, and oil cooler core	.....	20-30
Clean and flush system; check thermostats	Opening range 177°F. to 182°F.	20-30
Check pressure cap	6.25 to 7.50 psi release pressure	20-30
Cylinder Head and Valves Torque cylinder head cap screws	130 ft-lbs in sequence	20-10
Set valve clearance	Intake - 0.018 in. Exhaust - 0.028 in.	20-10
Diesel Fuel System Check fuel tank for water	.....	30-10
Check fuel pump pressure	3-1/2 - 4-1/2 psi	30-10
Change filter	.....	30-10
Service injection nozzles	.....	30-10
Injection Pump: Service and check timing	TDC	30-10
Adjust throttle linkage	6° advance at 1900 rpm (no load) 2650 rpm idle speed, 2500 max. transport speed 2150 rpm idle speed, 1900 load speed 2400 rpm idle speed, 2200 load speed 800 rpm, slow idle speed	30-10
Lubrication system Check engine oil pressure	40 - 50 psi (1900 rpm)	20-25
Charging System Check battery specific gravity	1.240 - 1.260	40-10
Check battery water consump- tion and electrolyte level	.....	40-10
Clean battery, cables, and box	.....	40-10
Check alternator belt tension	25 lbs. at 1 in. belt deflection, 20 lbs at 1 in. deflection on air conditioned tractors.	40-10
Check alternator output	45 amps at 13 to 15 volts (1440 engine rpm) 65 amps at 13 to 15 volts (1440 engine rpm) on tractors with air conditioning	40-10
Check alternator regulated voltage	14.2 - 14.6 volts (operating)	40-10

Engine Tune-Up—Continued

Operation	Specification	Section-Group Reference
Starting System		
Check start-safety switch operation		40-15
Check battery voltage when starting	Min. 9 volts (cranking)	40-15
Check starter current draw	Diesel - approx. 400 amps	40-15
Check operation of alternator, oil pressure, and Power Shift transmission filter restriction indicator lights		40-25

Final Engine Test

Operation	Specification	Section-Group Reference
Dynamometer Test (at 2200 engine rpm)	Compare with previous recorded output; record for future use.	FOS - 30 Manual, Chapter 12

Tractor Tune-Up

Operation	Specification	Section-Group Reference
Adjust Syncro-Range transmission clutch free travel	1-1/2 in.	50-5
Check Power Shift transmission disconnect lever operation	6 in. travel	50-10
Transmission		
Check shifting		50-15
Check for proper operation without excessive noise		50-15 & 20
Power Shift transmission pump pressure	165 - 185 psi	50-20
Power Shift engaged element pressure	Max. of 15 psi less than pump	....
Check differential lock operation	420 - 480 psi	50-25
Check brake pedal travel and even position	3 in. max. for one emergency application immediately after stopping engine	70-25
Check front wheel bearing adjustment and lubrication	35 ft-lbs; back-off to nearest hole	....
Check front wheel tow-in	1/8 - 3/8 in.	....
Check tire inflation		Operator's manual

Tractor Tune-Up—Continued

Operation	Specification	Section-Group Reference
Check Power Front-Wheel Drive operation .....	.....	50-45
Transmission pump	9 gpm at 1900 rpm - Syncro-Range 12 gpm at 1900 rpm - Power Shift	70-5
Main hydraulic pump	Standby - 2200 - 2300 psi (2300 psi for Power Front-Wheel Drive) Capacity - 22 gpm (2000 psi and 1900 rpm)	70-5
Pressure control valve	1650 - 1700 psi at 800 rpm (approximately 5 gpm flow)	70-5
Rockshaft:		
Lift cycle time (75 degrees rotation)	2.5 - 2.7 seconds at 1900 rpm	70-30
Maximum oil flow	10.5 to 11.5 gpm at 2000 psi and 1900 rpm	70-30
Lever position (depth control)	Complete raise at 1/32-inch from end of slot	70-30
Lever position (load control)	0 of quadrant to raise (rear lever edge)	
Negative stop adjustment	1/8th turn back out after contacting transmission case	70-30
Selective control valve	2 to 12-1/2 gpm at 1500 psi and 1900 rpm	70-5
Power Front-Wheel Drive pressure control	1900 - 2000 psi at 1200 rpm, 4th gear, high torque, and 2 gpm flow through jumper hose at breakaway coupler	50-45

Hydraulic system pressures, flow rates, or cycle times are for conditions specified in Section 70 (tractor at operating temperature, transmission-hydraulic oil at 140°F. to 160°F. proper test equipment, correct test sequence, etc.).

Group 20 LUBRICATION

GENERAL INFORMATION

Carefully written and illustrated instructions are included in the tractor operator's manual. Remind your customer to follow the recommendations in these instructions.

For your convenience when servicing the tractor, the following chart showing capacities and type of lubricant for the various components has been included. Additional lubrication information in on page 20-2.

Component	Capacity	Type of Lubricant	Interval of Service
Engine Crankcase	17 U.S. quarts (includes filter)	See "Engine Lubricating Oils" on page 20-2	10 Hours - Check level 100 Hours - Change oil 200 Hours - Replace filter
Transmission and Hydraulic System	* 18 U.S. gallons (Synchro-Range) * 16 U.S. gallons (Power Shift)	John Deere Hy-Gard Transmission and Hydraulic Oil	200 Hours - Check level 600 Hours - Replace filter 1200 Hours - Change oil
Front Wheel Bearings	.....	Wheel Bearing Grease	1200 Hours - Repack bearing
Grease Fittings	.....	SAE Multipurpose Grease	See Operator's Manual

* Add 4-1/2 gals. to capacity if equipped with Power Front-Wheel Drive.

LUBRICANTS

ENGINE LUBRICATING OILS



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 atmospheric temperature at start 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 Supreme Oil	Other Oils	
		Single Viscosity Oil	Multi-Viscosity Oil
Above 32°F (0°C)	SAE 30	SAE 30	Not recommended
-10 to 32°F** (-23 to 0°C)	SAE 10W-20	SAE 10W	SAE 10W-30
Below -10°F (-23°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 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

Use John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease for all grease fittings. Application of grease as instructed in the lubrication section will provide proper lubrication and will keep contamination out of bearings.

STORING LUBRICANTS

Your 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.