



# 4000 & 4020 TRACTORS



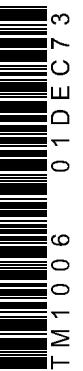
JOHN DEERE

## TECHNICAL MANUAL 4000 & 4020 TRACTORS

TM1006 (01DEC73) English

**TM1006 (01DEC73)**

LITHO IN THE U.S.A. (REVISED)  
ENGLISH



# 4000 AND 4020 TRACTOR (Serial No. 201,000 - Up)

Technical Manual  
TM-1006 (Aug-70)

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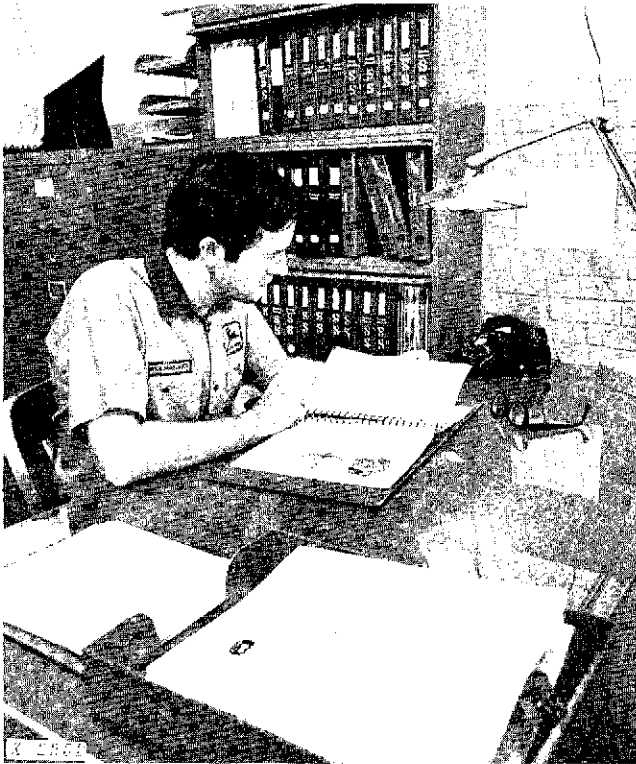
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## INTRODUCTION



*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 men and for reference by experienced men.

*Technical Manuals* are concise service guides for a *specific* machine. Technical Manuals are on-the-job guides containing only the vital information needed by a journeyman mechanic.




When a serviceman 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 whole manual*
- *Contents at front of each Section*
- *Specifications at end of each Group*
- *Special tools at end of each Group*

 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.

This technical manual was planned and written for you—a journeyman mechanic. 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.

# Section 10 GENERAL

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## Group 5

# GENERAL TRACTOR SPECIFICATIONS

PTO HORSEPOWER (Officially observed at 2200 engine rpm with synchro-range transmission)

	4000	4020
Diesel . . . . .	96.89	94.9 hp.
Gasoline . . . . .	*96	96.7 hp.
LP-gas . . . . .		94.6 hp.

### ENGINE

Type . . 4-stroke cycle, 6-cylinder in-line, valve-in-head

#### Bore and Stroke:

Diesel . . . . . 4-1/4 x 4-3/4 in.  
 Gasoline and LP-gas . 4-1/4 x 4-1/4 in.

#### Displacement:

Diesel . . . . . 404 cu. in.  
 Gasoline and LP-gas . . . . . 362 cu. in.

#### Compression ratio:

Diesel . . . . . 16.3 to 1  
 Gasoline . . . . . 7.5 to 1  
 LP-gas . . . . . 9.0 to 1

Firing order . . . . . 1-5-3-6-2-4

### ENGINE (Continued)

#### Engine Speeds:

Working range . . . . . 1500 to 2200 rpm  
 Maximum transport speed . . . 2500 rpm  
 Slow idle . . . . . 800 rpm

### COOLING SYSTEM

Type . Pressurized system with centrifugal pump

Engine temperature control . . . Heavy-duty thermostat

### LUBRICATION SYSTEM

Type . Force-feed, pressurized with full-flow oil filter.

### FUEL SYSTEM

Diesel . . . Direct injection, inlet metering, distributing-type.  
 Diaphragm-type fuel pump.

\*Factory observed.

**FUEL SYSTEM (Continued)**

Gasoline . . . Pressure system, diaphragm-type fuel pump, single barrel, updraft carburetor with electrical shut-off  
LP-gas . . . Fuel strainer with electrical shut-off, convertor, and single barrel, updraft carburetor with fuel metering valve

**CAPACITIES**

Fuel tank  
Diesel and gasoline . . . . . 34 U.S. gals.  
LP-gas (80% full) . . . . . 45 U.S. gals.  
Cooling system . . . . . 24 U.S. qts.  
Crankcase  
Gasoline, LP-gas, and Hi-Crop diesel engines  
Dry measurement . . . . . 9 U.S. qts.  
At 100 hour service interval 7 U.S. qts.  
At 200 hour service interval 8 U.S. qts.  
Row-Crop and standard diesel engines  
Dry measurement . . . . . 13 U.S. qts.  
At 100 hour service interval 11 U.S. qts.  
At 200 hour service interval 12 U.S. qts.  
Transmission-Hydraulic system\*  
Syncro-Range  
Dry measurement . . . . . 13 U.S. gals.  
At service intervals . . . 10 U.S. gals.  
Power Shift  
Dry measurement . . . . . 17 U.S. gals.  
At service intervals . . . 14 U.S. gals.  
Belt pulley . . . . . 2-1/2 U.S. pints  
Hi-crop final drive housing. 1-3/4 U.S. qts.

**ELECTRICAL SYSTEM**

Type . . . . . 12-volt, negative ground  
Alternator . . . . . 12-volt, 55 amps  
Air Conditioned Cab . . . 12-volt, 72 amps  
4000 tractors . . . . . 12 volt, 35 amps  
Battery:  
Diesel . . . . . Two, 6-volt, 75-plate 172-ampere-hour  
Gasoline and  
LP-gas . . . . . One, 12-volt, 78-plate 78-ampere-hour

**SYNCRO-RANGE TRANSMISSION**

Transmission clutch . . . One dry-disk, foot operated  
PTO clutch . . . One dry-disk, hydraulically actuated, lever operated

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

**SYNCRO-RANGE TRANSMISSION(Continued)**

Transmission type . . . Constant-mesh, helical gear, synchronized shifting within stations  
4000 tractors . . . Synchronized shifting in forward gears within stations  
Speeds . . . . . 8 forward; 2 reverse

**POWER SHIFT TRANSMISSION**

Engine disconnect . . . One dry-disk, lever operated clutch  
PTO clutch . . . Wet disk, hydraulically actuated, lever operated  
Transmission type . . . Planetary gears, clutches and brakes wet disk, hydraulically actuated, controlled by speed selector  
Speeds . . . . . 8 forward; 4 reverse

**GROUND SPEED (Row-Crop Tractor with 18.4-34 Rear Tires and 1900 Engine Rpm)**

Gear	Syncro-Range	Power Shift
1st	1.6 mph	1.5 mph
2nd	2.6 mph	2.2 mph
3rd	3.4 mph	3.4 mph
4th	4.4 mph	4.4 mph
5th	5.5 mph	5.7 mph
6th	7.2 mph	7.3 mph
7th	9.3 mph	9.7 mph
8th	15.2 mph	16.2 mph
1st reverse	3.3 mph	1.8 mph
2nd reverse	5.3 mph	2.6 mph
3rd reverse	. . . . .	4.0 mph
4th reverse	. . . . .	5.1 mph

**POWER FRONT WHEEL DRIVE**

Type . . . Hydraulic motor driven with planetary gear reduction in wheel hub, uses pressure oil from hydraulic system  
Torque . . . . . Low (series operated) and high (parallel operated)  
Controls . . . Solenoid operated control valves, synchronized with transmission controls

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

**POWER TAKE-OFF**

Type... Single 1-3/8-inch PTO shaft with mid and rear power take-off. Rear output shafts changed for rear PTO speed conversion.

PTO Speed (1900 engine rpm):

Mid PTO (4020) . . . . . 1000 rpm

Rear PTO . . . . . 540 or 1000 rpm

Rear PTO Ahead of Drawbar Hitch Point:

540 rpm . . . . . 13.8 in.

1000 rpm . . . . . 15.9 in.

**BELT PULLEY**

Diameter . . . . . 12 in.

Width . . . . . 8-1/2 in.

Pulley speed (1900 engine rpm) . . . . . 966 rpm

Belt speed . . . . . 3034 fpm

**HYDRAULIC SYSTEM**

Type... Closed center, constant pressure. Actuates power steering, power brakes, Power Front Wheel Drive, and implement control.

Standby pressure . . . . . 2250 psi

**BRAKES**

Type... Hydraulically actuated power disk type operating in oil.

**STEERING**

Type... Hydraulically actuated power, manual operation in case of hydraulic failure.

**REAR AXLES**

Types available . . . . . Regular, long, extra long, and special dual

**FRONT TIRES**

Row-Crop . . . . . 6.00-16, 6-ply

7.50-15, 6-ply

7.50-15, 8-ply

7.50-16, 10-ply

7.50-18, 6-ply

10.00-16, 6-ply

11.00-12, 12-ply

11.00L-15, 6-ply

11.00-16, 8-ply

11.2-24, 6-ply

12.4-24, 6-ply

12.4-24, 6-ply C&R

Standard . . . . . 7.50-18, 6-ply

10.00-16, 6-ply

Hi-Crop . . . . . 7.50-20, 6-ply

**REAR TIRES\***

Row-Crop . . . . . 13.6-38, 6-ply

15.5-38, 6-ply

15.5-38, 8-ply

16.9-34, 6-ply

16.9-34, 8-ply

16.9-38, 8-ply

18.4-34, 6-ply

18.4-34, 8-ply

23.1-30, 8-ply

Standard . . . . . 18.4-34, 6-ply

18.4-34, 8-ply

23.1-30, 8-ply

Hi-Crop . . . . . 15.5-38, 8-ply

18.4-34, 6-ply

18.4-34, 8-ply

**FRONT WHEEL TREAD**

Row-Crop

Regular tread. 6.00 tire - 48.5 to 82.3 in.

7.50 tire - 50.8 to 79.9 in.

10.00 tire - 54.5 to 78.5 in.

11.00 tire - 52.8 to 77.9 in.

Wide tread . . . 6.00 tire - 56.5 to 90.3 in.

7.50 tire - 58.8 to 87.9 in.

10.00 tire - 62.5 to 86.5 in.

11.00 tire - 60.8 to 85.9 in.

Power Front Wheel Drive

6-ply R-1 tire . . . . . 64 to 82 in.

6-ply C&R tire . . . . . 66 to 82 in.

Standard

Fixed tread . . . . . 55.5 and 60.8 in.

Adjustable tread . . . . . 50 to 79.3 in.

Hi-Crop . . . . . 60 to 89.3 in.

**REAR WHEEL TREAD**

Row-Crop

Regular axle

Regular wheel . . . . . 60 to 91 in.

Offset wheel . . . . . 60 to 96 in.

13.6-38 tires . . . . . 60 to 99 in.

23.1-30 tires . . . . . 66 to 94 in.

Long axle

Regular wheel . . . . . 60 to 97 in.

Offset wheel . . . . . 60 to 102 in.

13.6-38 tires . . . . . 60 to 105 in.

23.1-30 tires . . . . . 66 to 100 in.

Extra long axle

Regular wheel . . . . . 67 to 105 in.

Offset wheel . . . . . 60 to 110 in.

13.6-38 tires . . . . . 67 to 113 in.

23.1-30 tires . . . . . 67 to 108 in.

Special dual axle

Offset wheel . . . . . 60 to 120 in.

18.4-34 tires . . . . . 66 to 115 in.

\*Additional tires sizes available.

REAR WHEEL TREAD (Continued)

Standard	
Regular axle. . . . .	66 to 94 in.
Long axle. . . . .	66 to 100 in.
Hi-Crop. . . . .	73 to 97 in.

DIMENSIONS

Row-Crop:	
Wheel Base:	
Adjustable-tread front axle. .	100.3 in.
Double front wheel, Roll-O-Matic, and single front wheel. . . . .	97.5 in.
Over-all height:	
Without cab . . . . .	90.7 in.
Cab without Air Conditioning:	
Stolper . . . . .	110.0 in.
Hinson . . . . .	105.3 in.
Cab with Air Conditioning:	
Stolper . . . . .	112.0 in.
Hinson . . . . .	113.0 in.
Height to steering wheel. . . . .	79.8 in.
Over-all length. . . . .	152.7 in.
Width:	
Regular axle. . . . .	89.6 in.
Long axle. . . . .	95.9 in.
Extra long axle. . . . .	103.9 in.
Special dual axle. . . . .	113 in.
Clearance (crop):	
Adjustable axle. . . . .	24.8 in.
Rear axle housing. . . . .	27.1 in.
Rear axle. . . . .	27.9 in.
Clearance (drawbar). . . . .	16 in.
Turning Radius:	
Double front wheel, Roll-O-Matic, and single front wheel. . . . .	9 ft. 2 in.
Adjustable tread front axle	10 ft. 8 in.
**Shipping Weight:	
Diesel . . . . .	8555 lbs.
Gasoline . . . . .	8305 lbs.
LP-gas . . . . .	8490 lbs.
Standard:	
Wheelbase	
Short. . . . .	89 in.
Long. . . . .	100.3 in.
Over-all height. . . . .	90.4 in.
Height to steering wheel. . . . .	79.4 in.

DIMENSIONS (Continued)

Over-all length. . . . .	152.7 in.
Width:	
Regular axle. . . . .	89.6 in.
Long axle. . . . .	95.9 in.
Extra long axle. . . . .	113.1 in.
Clearance (crop):	
Adjustable axle. . . . .	22.5 in.
Rear axle. . . . .	27.9 in.
Rear axle housing. . . . .	27.1 in.
Clearance (drawbar). . . . .	16 in.
Turning Radius:	
Short wheel base. . . . .	9 ft. 7 in.
Long wheel base. . . . .	10 ft. 10 in.
**Shipping Weight:	
Diesel . . . . .	8185 lbs.
Gasoline . . . . .	7935 lbs.
LP-gas . . . . .	8120 lbs.
Hi-Crop:	
Wheel base. . . . .	100.3 in.
Over-all height. . . . .	105.6 in.
Height to steering wheel. . . . .	94.8 in.
Over-all length. . . . .	150.9 in.
Width. . . . .	95.4 in.
Clearance (crop):	
Front axle. . . . .	39.3 in.
Rear axle. . . . .	28.9 in.
Rear housing. . . . .	37.6 in.
Turning radius. . . . .	11 ft. 3 in.
**Shipping Weight:	
Diesel . . . . .	9235 lbs.
Gasoline . . . . .	8985 lbs.
LP-gas . . . . .	9170 lbs.

*\*\*Weights are for diesel tractors with Power Shift transmission, 3-point hitch, and regular cast wheel equipment. Deduct approximately 225 pounds for tractors with Syncro-Range transmissions. Add approximately 1000 pounds for tractor with Power Front Wheel Drive. Shipping weight for the 4000 gasoline - 7699 lbs; diesel - 7900 lbs.*

*(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.

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 then serve as a basis for certifying 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	Specifications	Reference
Check radiator for coolant loss and antifreeze protection. . . . .	1-1/2 inches above baffle.	. . . . .
Drain fuel system (gasoline). . . . .	. . . . .	Operator's manual
Reduce shipping pressure of tires . . .	. . . . .	Operator's manual
Cover tractor and tires for protection and cleanliness . . . . .	. . . . .	. . . . .

**BEFORE DELIVERING TRACTOR**

<u>Cooling System</u>		
Inspect radiator for coolant loss . . . .	1-1/2 inches above baffle.	. . . . .
Check antifreeze protection . . . . .	. . . . .	. . . . .
<u>Electrical System</u>		
Install electrolyte and charge batteries . . . . .	. . . . .	FOS-20
Stamp date code on battery . . . . .	. . . . .	FOS-20
Connect alternator. Remove resistor if present. 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



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BEFORE DELIVERING TRACTOR—Continued

Service	Specifications	Reference
<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 - 85 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
Check distributor lubrication . . . . .	Distributor cam lubricant	Section 40, Group 20
<u>Engine</u>		
Check air cleaner. . . . .	. . . . .	Operator's manual
Fill fuel tank and start engine. . . . .	Diesel and gasoline - 34 U.S. gallons; LP-Gas - 45 or 39 U.S. gallons	Operator's manual
Check operation of flasher, gauges, and indicator lamps. . . . .	. . . . .	Operator's manual
Check throttle linkage for free operation . . . . .	. . . . .	Section 20, Group 35
Check engine timing . . . . .	Diesel - TDC Gasoline - 20° BTDC, 2000 rpm LP-gas - 25° BTDC, 2000 rpm	Section 40, Group 20
Check engine idle speeds. . . . .	Diesel - 800 rpm, 2150 rpm, 2400 rpm, and 2650 rpm Gasoline, LP-Gas - 800 rpm, 2170 rpm, 2440 rpm, and 2690 rpm	Section 20, Group 35
<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 when clutch is disengaged.	Section 50, Group 15

**BEFORE DELIVERING TRACTOR—Continued**

Service	Specifications	Reference
Shift transmission through all speeds.	.....	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 brake accumulator .....	Not to exceed 3 in. immediately after stopping engine.	Section 70, Group 25
Check hydraulic system operation: Rockshaft, steering, and remote cylinder .....	.....	Operator's manual
Check implement hitch operation ...	.....	Operator's manual
Check seat operation. ....	.....	Operator's manual
Check operation of air conditioning system and heater system (if equipped) .....	.....	Operator's manual
Check air conditioner compressor drive belt .....	1/4 in. deflection, 15 lb. pull	Operator's manual
Adjust headlights and check operation	.....	Operator's manual
<u>General</u>		
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.

It is a well-known fact that 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.

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 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 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 customer's 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	Specifications	Reference
<u>Cooling System</u>		
Check radiator coolant level . . . . .	1-1/2 inches above baffle.	. . . . .
Clean external surface of radiator core . . . . .	. . . . .	. . . . .
Check hoses and connections for leaks . . . . .	. . . . .	. . . . .
<u>Fuel System</u>		
Remove water and foreign matter from fuel pump and filter sediment bowls . . . . .	. . . . .	Operator's manual
Bleed fuel system . . . . .	. . . . .	Operator's manual




INSPECTION PROCEDURES—Continued

Service	Specifications	Reference
Tighten loose connections and check entire system for leaks correct if necessary . . . . .	. . . . .	. . . . .
Check air cleaner cup, element, and unloading valve. Clean element if necessary . . . . .	. . . . .	Operator's manual
<u>Electrical System</u>		
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 belt tension. . . . .	1-inch deflection with a 25-pound force.	Operator's manual
Start engine and check action of starter, lights, and indicator lamps . .	. . . . .	Operator's manual
<u>Lubrication</u>		
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
Check distributor lubrication . . . . .	Distributor cam lubricant	Section 40, Group 20
<u>Engine</u>		
Check valve clearance (static, hot) . .	Diesel - 0.018 in. Gasoline, LP-Gas - Intake - 0.015 in. Exhaust - 0.028 in. (hot) 0.031 in. (cold)	Operator's manual
Check engine speed under load, fuel consumption, and horsepower . . . . .	. . . . .	Group 15 of this Section.
<u>Hydraulic System</u>		
Check rockshaft and remote cylinder operation. . . . .	. . . . .	Operator's manual
Check power steering . . . . .	Smooth, easy operation.	Section 70, Group 20
Check brakes and brake accumulator. . . . .	Not to exceed 3 in. immediately after stopping engine.	Operator's manual Section 70, Group 25

**INSPECTION PROCEDURES—Continued**

Service	Specifications	Reference
<u>Clutches and differential lock</u>		
Check transmission clutch free travel (Synchro-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 when clutch is 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 40 & 45
Check differential lock operation. . . . .	.....	Operator's manual
Check air conditioning and heater system for proper operation (if equipped) . . . . .	.....	Operator's manual
Check air conditioner compressor drive belt . . . . .	1/4 in. deflection, 15 lb. pull	Operator's manual
<u>Nuts and Cap Screws</u>		
Tighten accessible nuts and cap screws that seem to require adjustment . . . . .	.....	.....

**TORQUE CHART**

RECOMMENDED TORQUE IN FT.-LBS COARSE AND FINE THREADS			
			
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 (B-grade).

*3-Dash Head:* tempered steel high-strength bolts and cap screws (D-grade).

*6-Dash Head:* tempered steel extra high-strength bolts and cap screws (F-grade).