# 2940
# Tractor

JOHN DEERE

## TECHNICAL MANUAL

2940
Tractor

TM1220 (01MAR83) English

**John Deere Tractor Works**
**TM1220 (01MAR83)**

LITHO IN U.S.A.
ENGLISH

# 2940 TRACTOR TECHNICAL MANUAL TM-1220 (MAY-82)

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All information, illustrations and specifications contained in this technical manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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# GENERAL

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# SPECIFICATIONS AND SPECIAL TOOLS

## SPECIFICATIONS

### Serial Numbers

The engine serial number is stamped into the plate located on the lower front right-hand side of the cylinder block.

*NOTE: When ordering engine parts, quote all digits of serial number stamped on the plate*

The plate showing the tractor serial number is located on the right-hand side of the front axle carrier.

*NOTE: When ordering tractor service parts (excluding engine parts), quote all digits of serial number stamped on the plate.*

A plate showing the tractor type, transmission serial number, cone point measurement etched into pinion face of differential drive shaft (as well as reduction of differential) is located on the right-hand side of the transmission case.

### Model Numbers

The fuel injection pump, fuel injection nozzles, alternator, starting motor, hydrostatic steering valve and hydraulic pump have model numbers to facilitate identification of different makes of a given unit.

### Engine

| | | |
|---|---|---|
| Number of cylinders | | 6 |
| Cylinder liner bore | | 106.5 mm (4.19 in.) |
| Stroke | | 110 mm (4.33 in.) |
| Displacement | | 5883 cm³ (359 cu. in.) |
| Compression ratio | | 16.8:1 |
| Maximum torque at 1400 rpm | | 320 N·m (236 ft-lb) |
| Firing order | | 1-5-3-6-2-4 |
| Valve clearance (engine hot or cold) | | |
| Intake valve | 0.35 mm | (0.014 in.) |
| Exhaust Valve | 0.45 mm | (0.018 in.) |
| Fast idle speed | | 2660 rpm |
| Slow idle speed | | 750 rpm |
| Rated engine speed | | 2500 rpm |
| Working speed range | | 1400 to 2500 rpm |

PTO* Horsepower at engine rated speed—2500 rpm ..... 60 kW (80 HP)

Lubrication system ..... Full internal force feed system with full flow filter

**Engine Clutch** ..... Single dry disk clutch with torsion damper, foot-operated

## Cooling System

Type ..... Pressurized system with centrifugal pump

Temperature regulation ..... Two thermostats

## Fuel System

Type ..... Direct injection

Fuel injection pump timing to engine ..... TDC

Fuel injection pump type ..... Distributor type

Air cleaner ..... Dry-type air cleaner with secondary (safety) element

## Electrical System

Batteries ..... 2 x 12 volts, 88 Ah

Alternator with internal regulator ..... 14 volts, 33 or 55 amps.

Starting motor ..... 12 volts (3 kW) (4 HP)

Battery terminal grounded ..... Negative

## Synchronized Transmission

Type ..... Synchronized transmission

Gear selections ..... 8 forward and 4 reverse

Gear shifting ..... Two forward groups and one reverse group Synchronized forward and reverse shifting within groups

## Hi-Lo Shift Unit

Type ..... Hydraulic gear reduction unit which can be shifted under load with "wet" multiple disk clutch and brake packs

Travel speed decreases in each gear by ..... Approx. 20 percent

Shifting to reduced (Low) speed ..... Preloaded cup springs

Shifting to normal (High) speed ..... Hydraulic

** With the engine run in (above 100 hours of operation) and having reached operating temperature (engine and transmission); measured by means of a dynamometer. Permissible variation ± 5 percent.*

## Differential and Final Drives

Type of differential ..... Spiral bevel gears

Type of final drive ..... Planetary reduction drive

## Differential Lock

Operation ..... Hand or foot operated

Disengage ..... Will disengage automatically as soon as traction has equalized

## PTO

Type ..... Independent of transmission, can be engaged and disengaged under load

PTO speeds (with engine speed of 2400 rpm) ..... 540/1000 rpm

PTO clutch ..... Hydraulically operated "wet" disk clutch

PTO brake ..... Hydraulically operated "wet" disk brake

**ENGINE/PTO SPEED RELATIONSHIPS**

| Engine speed | 540 rpm shaft | 1000 rpm shaft |
|---|---|---|
| 800 | 180 | 335 |
| 2400 | 540 | 1000 |
| 2500 | 565 | 1040 |
| 2660 | 600 | 1110 |

## Mechanical Front Wheel Drive

Type ..... Engaged hydraulically, under full load with "wet" disk clutch

Control ..... Electrical/hydraulic solenoid switch

Engagement ..... Preloaded cup springs

Disengagement ..... Hydraulic

**Hydrostatic Steering** ..... Without mechanical linkage between steering valve and the front wheels

**Foot Brakes** ..... Self-adjusting, hydraulically operated "wet" disk brakes

**Handbrake** ..... Mechanically operated band-type locking brake acting on the differential

## Hydraulic System

| | | | |
|---|---|---|---|
| Type | Closed center, constant pressure system | | |
| Standby pressure | 15500 kPa | (155 bar) | (2250 psi) |
| Operating pressure | 14000 kPa | (140 bar) | (2050 psi) |
| Hydraulic pump | 8-piston pump with variable displacement | | |

## Capacities

| | | |
|---|---|---|
| Fuel tank | 126 liters | (33.3 U.S. gals.) |
| Cooling system | | |
| Without Sound-Gard Body | 19 liters | (5.0 U.S. gals.) |
| With Sound-Gard Body | 24 liters | (6.3 U.S. gals.) |
| Engine crankcase | | |
| Without filter change | 11 liters | (2.9 U.S. gals.) |
| With filter change | 11.5 liters | (3.0 U.S. gals.) |
| Transmission - Hydraulic system | | |
| Initial filling | 68 liters | (18.0 U.S. gals.) |
| Oil change | 60 liters | (15.9 U.S. gals.) |
| Mechanical front wheel drive | | |
| Front axle housing | 6.5 liters | (1.7 U.S. gals.) |
| Final drive housing, each | 1 liter | (0.3 U.S. gals.) |

**Travel Speeds** ..... See Operator's Manual

## Front and Rear Wheels

Tires, tread widths, tire pressure and ballast weights ..... See Operator's Manual

**Dimensions and Weights** ..... See Operator's Manual

# PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS

## Engine Speeds

| | |
|---|---|
| Slow idle | 750 rpm |
| Fast idle | 2660 rpm |
| Rated speed | 2500 rpm |

## Fan Belt

The fan belt should have 19 mm (0.75 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

## Compressor Belt

The compressor belt should have 6 mm (1/4 in.) flex with 70 N (15 lb) pull midway between pulleys.

## Batteries

| | |
|---|---|
| Specific gravity at an electrolyte temperature of 20°C (68°F) | |
| Normal and arctic conditions | 1.28 |
| Tropical conditions | 1.23 |

## [D] Clutch Operating Assy.

### [G] Tractors Without Sound-Gard Body

| | |
|---|---|
| Clutch pedal free travel | approx. 25 mm (1 in.) |

### [G] Tractors With Sound-Gard Body

| | | |
|---|---|---|
| Slave cylinder operating rod, stroke | 8.5 to 9.5 mm | (0.33 to 0.37 in.) |

## Front Wheel Toe-In

| | | |
|---|---|---|
| Tractors without MFWD | 3 to 6 mm | (0.12 to 0.25 in.) |
| Tractors with MFWD | 0 to 3 mm | (0 to 0.12 in.) |

## Torques for Hardware

| | | |
|---|---|---|
| Start safety switch in rockshaft housing, max. | 50 N·m | (35 ft-lbs) |
| Front wheel rim to hub | | |
| Tractors without MFWD | 180 N·m | (130 ft-lbs) |
| Tractors with MFWD | 300 N·m | (220 ft-lbs) |
| Axle knees to axle center, cap screws | 400 N·m | (300 ft-lbs) |
| Tie rod clamps, cap screws | 110 N·m | (80 ft-lbs) |
| Tie rod tube, cap screw | 50 N·m | (35 ft-lbs) |
| Wheel disk to hub (rack-and-pinion axle) | 400 N·m | (300 ft-lbs) |
| 2-post ROLL-GARD protective structure | | |
| Supports to crossbar, cap screws | 200 N·m | (145 ft-lbs) |
| Supports to final drives, cap screws and nuts | 400 N·m | (300 ft-lbs) |

# LUBRICATION AND SERVICE

## Capacities

Engine crankcase

| | | |
|---|---|---|
| Without filter change | 11 L | (2.9 U.S. gal.) |
| With filter change | 11.5 L | (3.0 U.S. gal.) |

Transmission - Hydraulic system

| | | |
|---|---|---|
| Initial filling | 68 L | (18.0 U.S. gal.) |
| Oil change | 60 L | (15.9 U.S. gal.) |

Mechanical front wheel drive

| | | |
|---|---|---|
| Front axle housing | 6.5 L | (1.7 U.S. gal.) |
| Final drive housing, each | 1.0 L | (0.3 U.S. gal.) |

## Service Intervals

| | |
|---|---|
| Checking crankcase oil level | every 10 hours |
| Changing engine oil | every 100 hours |
| Changing engine oil filter | every 200 hours |
| Checking transmission/hydraulic system oil level | every 50 hours |
| Changing transmission/hydraulic system oil filter | every 500 hours |
| Changing transmission/hydraulic oil | every 1000 hours |
| Changing hydrostatic steering filter | every 1000 hours |
| Cleaning hydraulic pump strainer | every 1000 hours |
| Checking MFWD oil level | every 100 hours |
| MFWD oil change | every 1000 hours |
| Cleaning and packing front wheel bearings | every 1000 hours |
| Lubricating grease fittings | |
| Front axle and front axle bearings | every 50 hours |
| Rear axle bearings | every 500 hours |
| in wet and muddy conditions | every 10 hours |
| Three-point hitch | every 200 hours |

## TUNE-UP

| | | | |
|---|---|---|---|
| PTO horsepower* at 2500 rpm rated engine speed | | 60 kW | 80 HP |
| Compression | 2100 kPa | 21 bar | (300 psi) |
| Slow idle | | | 750 rpm |
| Fast idle | | | 2660 rpm |
| Rated engine speed | | | 2500 rpm |
| Air intake system vacuum | 3.5 to 6.0 kPa | 35 to 60 mbar | (14 to 25 in. water head) |
| Air cleaner restriction warning switch closes at a vacuum of | 5.5 to 6.5 kPa | 55 to 65 mbar | (22 to 26 in. water head) |
| Blow-by at crankcase vent tube, max. | | 3.5 $m^3/h$ | (123.5 cu.ft./h) |
| Thermostats open at | | 82°C | (180°F) |
| Radiator cap high pressure valve opens at | 40 to 50 kPa | 0.4 to 0.5 bar | (6 to 7 psi) |
| Radiator cap low pressure valve opens at | 0 to 4 kPa | 0 to 0.04 bar | (0 to 0.6 psi) |

### Fan Belt

Fan belt should have 19 mm (0.75 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

### Compressor Belt

Compressor belt should have 6 mm (1/4 in.) flex with 70 N (15 lb) pull midway between pulleys.

** With the engine run in ( more than 100 hours of operation) and having reached operating temperature ( engine and transmission); measured by means of a dynamometer. Permissible variation ± 5%.*

## TRACTOR SEPARATION

### Torques for Hardware

| | | |
|---|---|---|
| Front axle carrier to engine block, cap screws | 230 N·m | (170 ft-lbs) |
| Front axle carrier to oil pan, cap screws | 400 N·m | (300 ft-lbs) |
| Engine block to front axle carrier, cap screws | 230 N·m | (170 ft-lbs) |
| Hydraulic pump drive shaft, cap screws | 50 N·m | (35 ft-lbs) |
| Jointed shaft flange to front axle drive hub (tractors with MFWD), cap screws | 70 N·m | (50 ft-lbs) |
| Clutch housing to engine block | | |
| Cap screws | 230 N·m | (170 ft-lbs) |
| Hex. nuts | 325 N·m | (240 ft-lbs) |
| Oil pan to clutch housing, cap screws | 230 N·m | (170 ft-lbs) |
| Clutch housing to transmission case, cap screws | 160 N·m | (120 ft-lbs) |
| Transmission case drain plugs | 135 N·m | (100 ft-lbs) |
| Hydraulic lines retainer to clutch housing, cap screw | 45 N·m | (32 ft-lbs) |
| Final drive housings to transmission case, cap screws | 230 N·m | (170 ft-lbs) |
| Rockshaft housing to transmission case, cap screws | 120 N·m | (85 ft-lbs) |
| Wheel disk to hub | 400 N·m | (300 ft-lbs) |
| Rear fenders to final drive housings, hex. nuts | 200 N·m | (145 ft-lbs) |
| 2-post ROLL-GARD protective structure to final drive housings | 400 N·m | (300 ft-lbs) |
| Both supports to crossbar | 200 N·m | (135 ft-lbs) |
| Basic weight to front axle carrier, cap screws | 400 N·m | (300 ft-lbs) |
| Drawbar to transmission case | | |
| Front cap screws | 230 N·m | (170 ft-lbs) |
| Rear cap screws | 120 N·m | (85 ft-lbs) |
| Sound - Gard Body to rubber bearing block, cap screws and hex. nuts | 200 N·m | (145 ft-lbs) |

## STANDARD TORQUES

| RECOMMENDED TORQUES IN N·m, AND FT-LBS FOR UNC AND UNF CAP SCREWS | | | | |
|---|---|---|---|---|
| **Head marking (identifying strength)** |  or 10.9* | |  or 12.9** | |
| **Thread-O.D. (in.)** | **N·m** | **ft-lbs** | **N·m** | **ft-lbs** |
| 1/4 | 15 | 10 | 20 | 15 |
| 5/16 | 30 | 20 | 40 | 30 |
| 3/8 | 50 | 35 | 70 | 50 |
| 7/16 | 80 | 55 | 110 | 80 |
| 1/2 | 120 | 85 | 170 | 120 |
| 9/16 | 180 | 130 | 240 | 175 |
| 5/8 | 230 | 170 | 320 | 240 |
| 3/4 | 400 | 300 | 580 | 425 |
| 7/8 | 600 | 445 | 930 | 685 |
| 1 | 910 | 670 | 1400 | 1030 |
| 1-1/8 | 1240 | 910 | 1980 | 1460 |
| 1-1/4 | 1700 | 1250 | 2800 | 2060 |

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*NOTE: A variation of ± 10% is permissible for all torques indicated in this chart.*

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.

* *Tempered steel high-strength bolts and cap screws*
** *Tempered steel extra high-strength bolts and cap screws*

| RECOMMENDED TORQUES IN N·m, AND FT-LBS FOR METRIC CAP SCREWS | | | | | | |
|---|---|---|---|---|---|---|
| Head marking (identifying strength) | 8.8* | | 10.9** | | 12.9*** | |
| Thread-O.D. (mm) | N·m | ft-lbs | N·m | ft-lbs | N·m | ft-lbs |
| M5 | 7 | 5 | 9 | 6.5 | 10 | 8.5 |
| M6 | 10 | 8.5 | 15 | 10 | 20 | 15 |
| M8 | 30 | 20 | 40 | 30 | 40 | 30 |
| M10 | 50 | 35 | 80 | 60 | 90 | 70 |
| M12 | 100 | 75 | 140 | 100 | 160 | 120 |
| M14 | 160 | 120 | 210 | 155 | 260 | 190 |
| M16 | 240 | 175 | 350 | 260 | 400 | 300 |
| M20 | 480 | 355 | 650 | 480 | 780 | 575 |
| M24 | 820 | 605 | 1150 | 850 | 1350 | 995 |
| M30 | 1640 | 1210 | 2250 | 1660 | 2700 | 1990 |
| M36 | 2850 | 2110 | 4000 | 2950 | 4700 | 3465 |

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*NOTE: A variation of ± 10% is permissible for all torques indicated in this chart.*

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.

* *Regular bolts and cap screws*
** *Tempered steel high-strength bolts and cap screws*
*** *Tempered steel extra high-strength bolts and cap screws*

| RECOMMENDED TORQUES IN N·m, AND FT-LBS FOR PIPE AND HOSE CONNECTIONS | | | | |
|---|---|---|---|---|
| | with O-rings | | with cone | |
| Thread size | N·m | ft-lbs | N·m | ft-lbs |
| 3/8-24 UNF | 7.5 | 5.5 | 8 | 6 |
| 7/16-20 UNF | 10 | 7 | 12 | 9 |
| 1/2-20 UNF | 12 | 9 | 15 | 11 |
| 9/16-18 UNF | 15 | 11 | 25 | 18 |
| 3/4-16 UNF | 25 | 20 | 45 | 35 |
| 7/8-14 UNF | 40 | 30 | 60 | 45 |
| 1-1/16-12 UNC | 60 | 45 | 100 | 75 |
| 1-3/16-12 UNC | 70 | 50 | 120 | 90 |
| 1-5/16-12 UNC | 80 | 60 | 140 | 105 |
| 1-5/8-12 UNC | 110 | 80 | 190 | 140 |
| 1-7/8-12 UNC | 150 | 110 | 220 | 160 |

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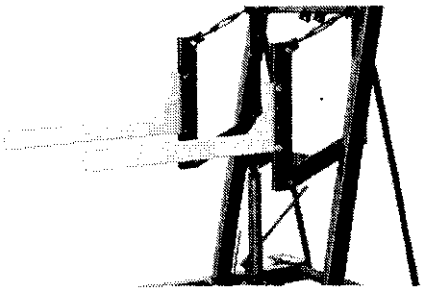
# SPECIAL TOOLS

## Tune-Up

| Tool | Number | Use |
|---|---|---|
| | D - 14546BA | Checking engine compression |

*Fig. 1 - Compression Test Gauge*

## Tractor Separation



| | | |
|---|---|---|
| | Brown Body Lift | To remove Sound-Gard Body |

*Fig. 2 - Brown Body Lift*

## Tractor Separation — Continued

| Tool Number | Use |
|---|---|
| 1. JD244-1 (Straight)<br>2. JD244-2 (Bent) | Tractor separations |

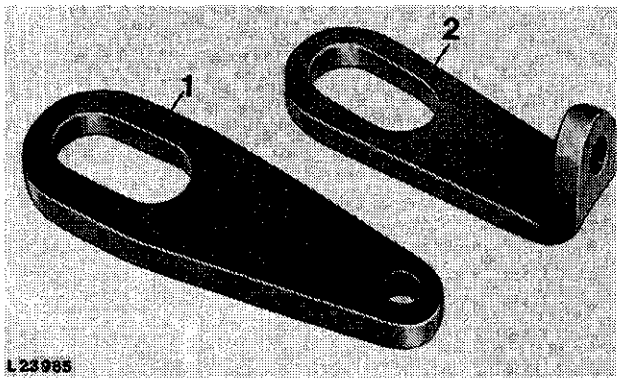



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*Fig. 3 - Lifting Eyes*

| | |
|---|---|
| JDG-21 Fork Lift Adapters | To remove Sound-Gard Body |

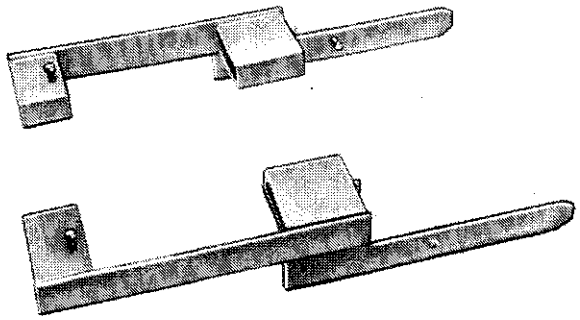

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*Fig. 4 - Fork Lift Adapters*

## Group 05

# PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS

The John Deere Delivery Receipt, when properly filled out and signed by the dealer and customer, verifies that the predelivery and delivery services were satisfactorily performed. When delivering this machine, give the customer his copy of the delivery receipt and the operator's manual. Explain their purpose to him.

An inspection tag (Predelivery Information) is attached to each new tractor before it leaves the factory.

According to this inspection tag the dealer will carry out a predelivery inspection including the repair of any possible shipping damage and giving the finishing touches to the tractor.

After the first 100 operating hours it is very important that the dealer perform an inspection. This is to ensure complete customer satisfaction and make sure that the tractor is operating correctly.

After completing the factory-recommended dealer checks and services listed on the predelivery inspection tag, send a copy to the factory and file the original with the shop order for the job. This will certify that the tractor has received proper delivery service.

## TRACTOR STORAGE

When storing a new tractor, proceed as follows:

### Short-Term (Under 30 Days)

1. Fill fuel tank. This prevents condensation of moisture in tank.

2. Check engine oil level, transmission-hydraulic oil level, and coolant level. Add oil or coolant if necessary. During cold weather, be sure coolant contains sufficient anti-freeze.

3. Check electrolyte level in batteries. If electrolyte does not cover plates, add distilled water. Make sure batteries are fully charged.

4. Store tractor in a dry, protected place. If necessary to store tractor outside, cover it with a protective material. Protect tires from heat, sunlight, and petroleum products.

### Long Term (Over 30 Days)

To protect engine, fuel system, transmission and hydraulic system, use the AR 41785 rust inhibitor. The above part no. includes one can of rust inhibitor, masking tape and protective caps to cover all engine openings.

Protect the engine as follows:

1. Add 300 c.c. (9 oz.) of rust inhibitor to the engine oil.

2. Add 225 c.c. (7.5 oz.) of rust inhibitor to the oil in the transmission/hydraulic system.

3. Drain fuel tank, pour 150 c.c. (5 oz.) of rust inhibitor into the empty tank and add approx. 10 liters (2.6 U.S. gals.) of fuel. Start engine and operate it at fast idle for 15 to 20 minutes to distribute the mixture through the whole fuel system. While the engine is running, operate the complete hydraulic system several times. Shut off engine in time to leave some fuel in the tank. Then allow the engine to cool down for 15 to 20 minutes.

4. Prepare 15 c.c. (0.5 oz.) of rust inhibitor for each cylinder. Remove plug of intake manifold or connecting pipe of starting fluid adapter at the intake manifold, whichever applies. Inject rust inhibitor into the intake manifold. Pull out shut-off knob and crank engine with starter several times.

However, do not allow the engine to start. Otherwise the whole procedure must be repeated.

After the rust inhibitor has been added, the engine may not be started again.

**IMPORTANT: Rust inhibitor agents evaporate very easily. For this reason, seal all openings after the inhibitor has been added. Also, always keep the inhibitor container closed.**

5. Fill the fuel tank.

6. Remove batteries. Add distilled water, if necessary. Charge the batteries and store in a cool, dry place where they will not freeze.

7. Seal all openings such as the vent tube and exhaust outlet.

8. Loosen fan belt.

9. Replace or repair damaged parts. Touch up any painted surfaces which are scratched or chipped.

10. Coat exposed metal surfaces, such as axles and piston rods of hydraulic cylinders, with grease or corrosion preventative.

11. Store the tractor in a dry, protected place. If the tractor is stored outside, cover it with a waterproof tarpaulin.

12. Block up the tractor so that tires do not touch the ground. Protect tires from heat and sunlight.

## Removing Tractor From Storage

1. Remove all protective coverings.

2. Check crankcase and transmission/hydraulic system oil levels.

3. Check coolant level.

4. Check tire inflation pressure.

5. Install batteries and connect cable and ground strap.

6. Adjust fan belt tension.

7. Carry out 500-hour check.

8. Run engine at approx. 1500 rpm for several minutes. Check all systems before placing tractor under load.

# PREDELIVERY INSPECTION

Before delivering the tractor to the customer, the following checks and services should be performed by the dealer:

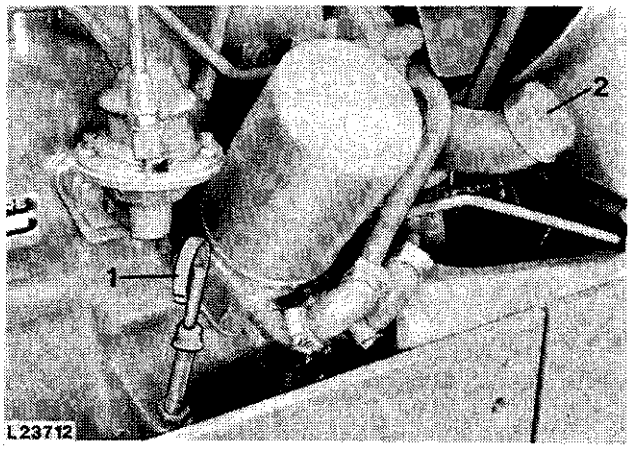
## Engine

### Leaks

1. Check engine and fuel lines for leaks. Repair as necessary.

### Checking Crankcase Oil Level

*NOTE: Tractor should be on a level surface when oil level is checked. If it is not, check only to make sure the crankcase is not dry. Recheck oil level later, when tractor is on level ground.*




**1—Dipstick** **2—Filler Cap**

*Fig. 1 - Engine Oil Dipstick and Filler Cap*

1. Pull out dipstick (1, Fig. 1) and check oil level.

2. If necessary, add oil to bring oil level to top mark on dipstick. Use John Deere TORQ-GARD SUPREME® engine oil SAE 10W-20 or an equivalent oil (see Group 10).

### Checking Coolant Level

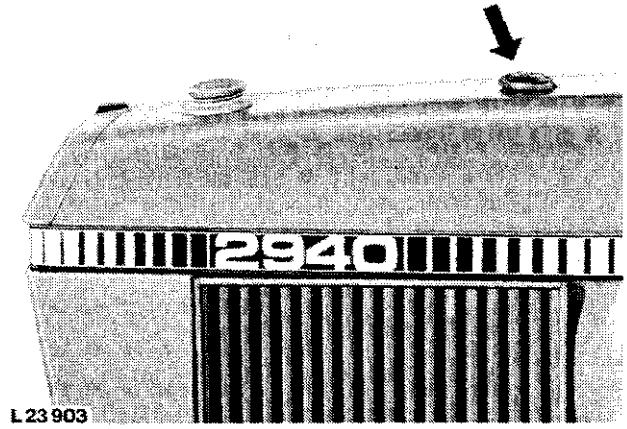



*Fig. 2 - Radiator Filler Cap*

1. Remove radiator filler cap and check coolant level. Coolant level must be midway between the filler neck and top of radiator core.

2. If necessary, add coolant to obtain this level. Use permanent-type, ethylene glycol antifreeze which contains a rust inhibitor but does not contain a stop leak-additive.

### Idle Speeds

1. Warm up engine to operating temperature and check slow and fast idle speeds. Adjust, if necessary (see Section 30, Group 30).

2. Slow idle speed: 750 rpm

3. Fast idle speed: 2660 rpm

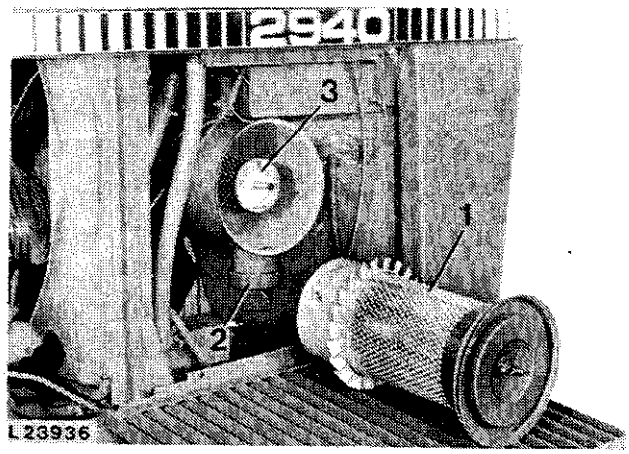
### Engine Shut-Off Cable

1. Check operation of shut-off cable. Move hand throttle lever completely forward and idle engine for 1 to 2 minutes.

2. Completely pull out shut-off knob, making sure engine stops immediately.

3. If necessary, adjust shut-off cable (see Section 30, Group 30).

### Air Cleaner and Safety Element




**1—Air Cleaner Element** **3—Safety Element**
**2—Dust Unloading Valve**

*Fig. 3 - Air Cleaner and Safety Element*

1. Check air cleaner and safety elements for proper installation.

2. Make sure that dust unloading valve (2, Fig. 3) (rubber cap) is installed on air cleaner.

### Air Intake Connections

1. Check air intake connections for tightness. Tighten any loose clamps.

### Exhaust Stack

1. Install exhaust stack, making sure it is in vertical position.

2. Install exhaust stack flap. When closed, flap should not contact exhaust stack end. If necessary, clamp flap to exhaust stack to obtain a clearance of 2 mm (0.08 in.) between flap and stack end.

### CHECKING V-BELT TENSION

### Fan Belt

1. The fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

### Compressor Belt (if equipped)

1. Compressor belt should deflect 6 mm (1/4 in.) when a 70 N (15 lb) force is applied midway between pulleys.

## Electrical System

### Batteries

1. Check battery terminals and battery cable ends. If they are corroded, clean and coat them with petroleum jelly.

2. Check electrolyte level in each battery cell. Add distilled water if necessary to bring level above cell plates.

3. If batteries are not fully charged, charge them. Connect charger to positive starter cable and to tractor frame. If using a fast charger, remove cell caps while charging.

### Important Notes

**1. If the engine is to be run for a short time without battery (using a slave battery for starting), do not, under any circumstances, interrupt the circuit by switching off the main switch before stopping the engine by means of the fuel pump shut-off cable. Further it is recommended to use additional current (lights) while engine is running. Do not run engine at a speed above 1000 rpm. Insulate battery end of disconnected starter cable properly to avoid damage to alternator and regulator.**

**2. Connect batteries or battery charger in the proper polarity. If they are improperly connected, the rectifier diodes will be immediately destroyed.**

### Neutral Start Switch

1. Check operation of start safety switch.

2. If the starting motor does not work although the main switch is in starting position and the range shift lever is in neutral position, check the neutral start switch by installing a new switch and check circuit (see Section 40, Group 15).

**IMPORTANT: Do not overtighten switch when installing it in the rockshaft housing. Tighten switch to maximum torque of 50 N·m (35 ft-lbs).**

### Lighting System

1. Check lighting system and repair as necessary. Replace any defective bulbs (see Section 40, Group 20).

2. Check headlight adjustment and correct, if necessary (see Section 40, Group 20).

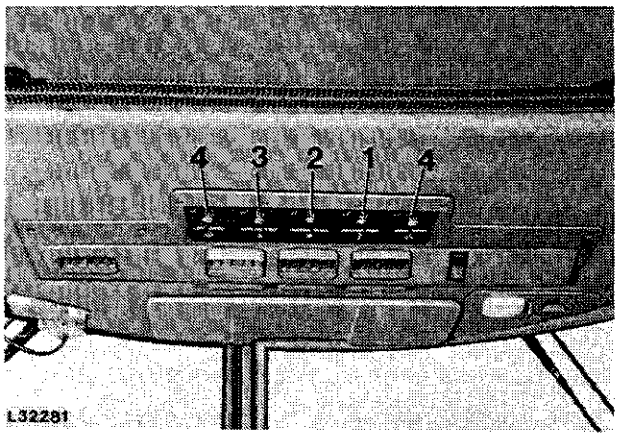
### SOUND-GARD BODY CONTROLS

### Fan Switch

1. Open air outlets. Check fan switch (2, Fig. 4) for proper operation.

### Heater Switch

1. With fan operating, check heater switch (1, Fig. 4) for proper operation. For this purpose, turn switch counterclockwise, making sure that warm air enters cab (with engine at operating temperature).




1—Heater Switch
2—Fan Switch
3—Thermostat Switch (Air Conditioning)
4—Windshield Wiper Switch

*Fig. 4 - Sound-Gard Body Controls*

### Thermostat Switch (Tractors with Air Conditioning)

1. With fan operating, check infinitely variable thermostat switch (if equipped) for proper operation. Turn off heater. Turn thermostat switch (3, Fig. 4) clockwise, making sure cool air enters cab. If switch does not operate correctly, see Section 90, Group 05.

### Windshield Wiper Switch

1. Check windshield wiper switch for proper operation.

## Controls and Instruments

1. Check controls and instruments for proper operation.

## Power Train

### Checking Transmission/Hydraulic System Oil Level

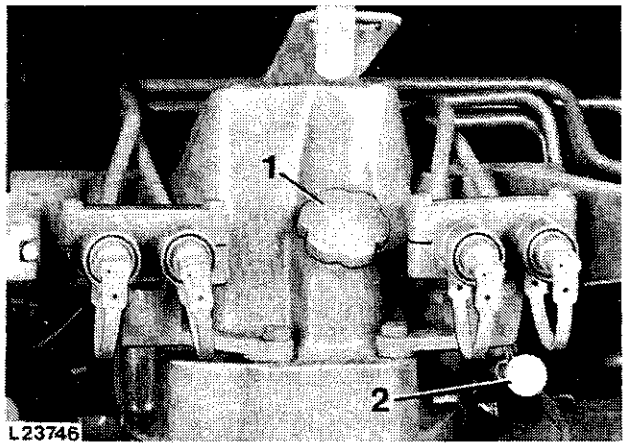
1. With tractor on level ground, run engine 2 to 3 minutes.

2. Place range and gear shift lever in neutral position.

3. Apply handbrake and engage clutch.

4. Lower draft links.

5. Run engine at slow idle (750 rpm).




1—Filler Cap
2—Dipstick

*Fig. 5 - Transmission/Hydraulic System Dipstick and Filler Cap*

6. Pull out dipstick and wipe clean.

7. Insert dipstick. Remove dipstick and check oil level.

8. If necessary, add John Deere HY-GARD® Transmission and Hydraulic Oil or equivalent oil to bring oil level to top mark on dipstick.

*NOTE: Types of oil not meeting our specifications will not give satisfactory service and may result in eventual damage.*

## Synchronized Transmission

1. Check transmission for proper operation.

2. While driving tractor, shift transmission through all gears. If transmission does not function properly, refer to Section 50, Group 30 and 35.

## Differential Lock

1. Check differential lock for proper operation. If you find any problem, refer to Section 50, Group 35.

## Independent PTO

1. Check PTO operation. For this purpose, run engine and move PTO control lever to engaged and disengaged position. If PTO does not operate properly, refer to Section 50, Group 45.

## Hi-Lo Shift Unit

Check Hi-Lo shift unit as follows:

1. Operate tractor in both high and low range, carefully observing both operations.

2. Use the brakes to simulate a load condition on the tractor.

3. Low oil pressure will be indicated by disk pack slippage, which causes the clutch pack to become noisy.

4. A mechanical failure in the Hi-Lo shift unit will also be indicated by unusual noise.

5. If you find any problems, refer to Section 50, Group 20.

## Clutch Pedal

### [G] On Tractors without SOUND-GARD BODY

1. Check clutch pedal free travel. It should be 25 mm (1 in.).

2. Make sure the clutch is fully disengaged before pedal contacts stop bracket. Adjust clutch pedal free travel, if necessary (see Section 50, Group 05).

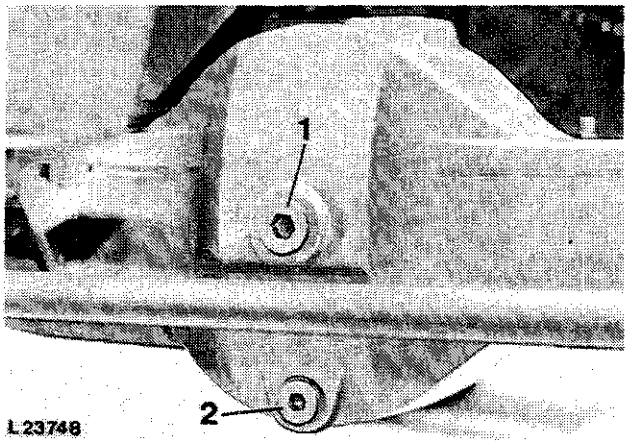
### On Tractors with SOUND-GARD BODY

1. Depress clutch pedal until it contacts stop. When doing this the operating rod should move 8.5 to 9.5 mm (0.33 to 0.37 in.) out of clutch operating cylinder.

2. When necessary, bleed clutch operating system (see Section 50, Group 10).

## Mechanical Front Wheel Drive

### Checking Axle Housing Oil Level



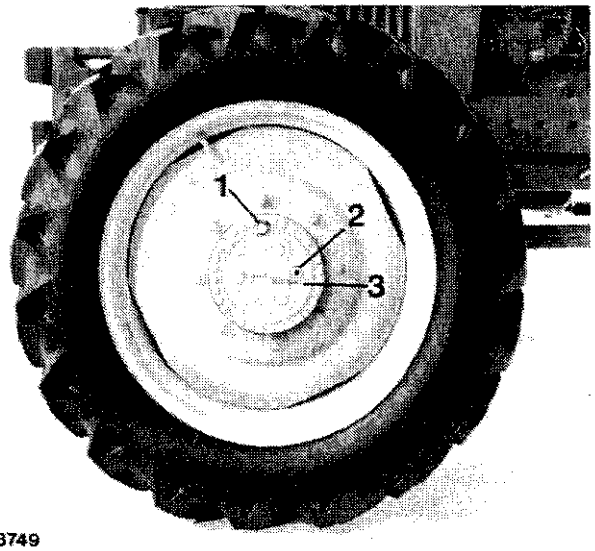

**1—Level Plug** **2—Drain Plug**

*Fig. 6 - Checking Axle Housing Oil Level*

1. Remove level plug (1, Fig. 6). Oil should be level with plug bore.

2. If necessary, top up with oil, using EP transmission oil according to specifications given in Group 10 of this Section.

### Checking Final Drives Oil Level

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1—Drain Plug
2—Level Plug
3—Oil Level Mark

*Fig. 7 - Checking Final Drives Oil Level*

1. Turn wheel until mark (3, Fig. 7) is in level position.

2. Remove level plug (2). Oil should be level with plug bore.

3. Add oil, if necessary, using EP transmission oil according to specifications given in Group 10 of this section.

### MFWD Operation

1. Check MFWD for proper operation. If you find any problems, refer to Section 50, Group 55.

## Steering and Brakes

### Steering

1. Check steering system for proper operation. In case of a malfunction, refer to Section 60, Group 05.

### Brakes

1. Check footbrakes and handbrake for proper operation. Adjust brakes, if necessary. Refer to Section 60, Group 10 if a malfunction occurs.

## Hydraulic System

### Three-Point Hitch

1. Free lift arms.

2. Install and/or adjust draft links and center link (see Operator's Manual).

### Rockshaft

Check rockshaft operation. In case of a malfunction, refer to Section 70, Group 20.

### Selective Control Valves

1. Check operation of selective control valves.

### Leaks

1. Check entire hydraulic system for leaks. Repair or replace components as necessary.

## Miscellaneous

### Wheel Bolts

1. Tighten all wheel bolts to the specified torque. See Section 80. Group 10.

### Tire Pressures

1. Check tire pressures (see Operator's Manual).

### Tread Width

1. Adjust tread width to customer's needs (see Operator's Manual).

### Toe-In

1. Check toe-in and adjust, if necessary (see Section 80, Group 05).

### Lubricating Points

1. Lubricate all lubricating points on tractor.

### ROLL-GARD

1. Check ROLL-GARD for proper installation.

2. Tighten cap screws to specified torque (see Section 90, Group 25).

### Guards

1. Check all guards for proper installation.

### Decals and Paint

1. Check decals and paint for proper condition.

## Sound-Gard Body

### Air Conditioning System

1. Check operation of air conditioning system. If you find any problems, refer to Section 90, Group 05.

2. Check refrigerant lines for leaks. Repair or replace parts as necessary.

### Operator's Seat

1. Check whether operator's seat can be adjusted properly.

2. Check seat belt for proper condition and correct installation.

3. Remove plastic cover from SMV (Slow Moving Vehicle) emblem and install emblem on back of operator's seat.

### Sound-Gard Body

1. Check Sound-Gard Body for proper installation.

2. Tighten attaching cap screws to specified torque, see Section 90, Group 20.

## DELIVERY INSPECTION

A thorough discussion of the operation and service of the tractor at the time of its delivery helps to assure complete customer satisfaction.

Proper delivery should be an important phase of the dealer's program.

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. Therefore, enough time should be devoted, at the customer's convenience, to introducing him to his new tractor and explaining to him how to operate and service it.

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

1. Operation of control levers and instruments.

2. Starting and shutting off the engine.

3. The importance of the tractor break-in period.

4. Use of counterweights and proper tire inflation pressure as well as filling of tires with water and calcium chloride, if required.

5. All functions of the hydraulic system.

6. Operating the PTO.

7. The importance of the safety rules.

8. The importance of lubrication and periodic service.

Give particular emphasis to sway blocks, rockshaft speed-of-drop, rockshaft selector lever (load and depth control), transmission oil pressure indicator light, engine oil pressure indicator light (whether temperature or pressure and what to do if lights go on) and alternator indicator light (indicating whether alternator is charging). These areas are very often misunderstood.

## AFTER-SALES INSPECTION

In the interest of the purchaser and dealer, an after-sales inspection should be carried out by the dealer after the first 100 hours of using a new John Deere tractor.

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.

Through this inspection a needless volume of service work can be eliminated by preventing minor difficulties from developing into serious problems later on. It also will promote stronger dealer-customer relations and give the customer an opportunity to ask questions that may have arisen during the first few days of use.

Thereby the dealer has the further opportunity of promoting the possible sale of other new equipment.

The following inspection program is recommended:

### Engine

#### Leaks

1. Check engine and fuel lines for leaks. Repair as necessary.

#### Oil and Filter Change

*NOTE: Drain oil with engine shut off, however, with engine oil warm.*

1. Remove drain plug.

2. While oil is draining, replace filter element.

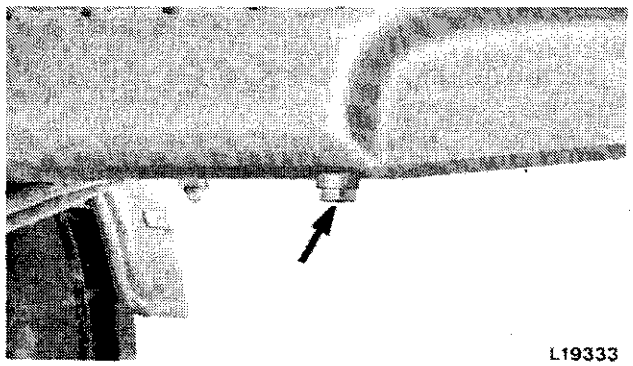


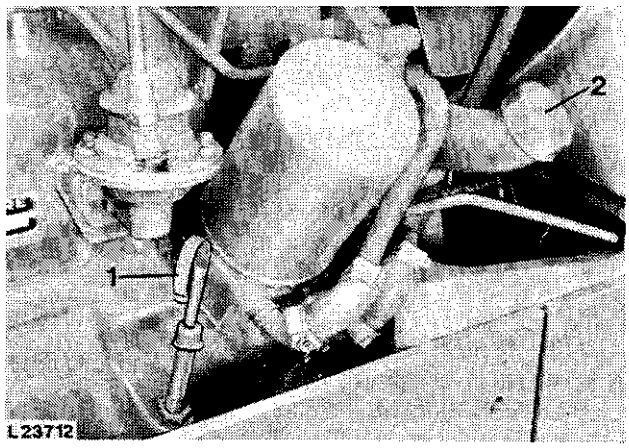

*Fig. 8 - Crankcase Drain Plug*

3. Remove filter element (turn counterclockwise) and clean mounting surface.

4. Apply a thin film of oil to sealing ring of new filter. Tighten filter element until sealing ring touches mounting surface, then turn an additional 1/2 to 3/4 turn. Do not overtighten.

5. Reinstall drain plug.

6. Fill crankcase with fresh oil of the proper viscosity (see Group 10).




**1—Dipstick**
**2—Filler Cap**

*Fig. 9 - Engine Oil Dipstick and Filler Cap*

7. Crankcase capacity with filter change is 11.5 liters (3.0 U.S. gal.).

8. Run engine for a short time and check for leaks at filter base and drain plug.

9. Stop engine.

10. Check oil level.

### Checking Valve Clearance

1. Using a feeler gauge, check valve clearance (see Section 20, Group 10).

Valve clearance (with the engine cold or warm)
Intake valve ..... 0.35 mm (0.014 in.)
Exhaust valve ..... 0.45 mm (0.018 in.)

### Checking Coolant Level

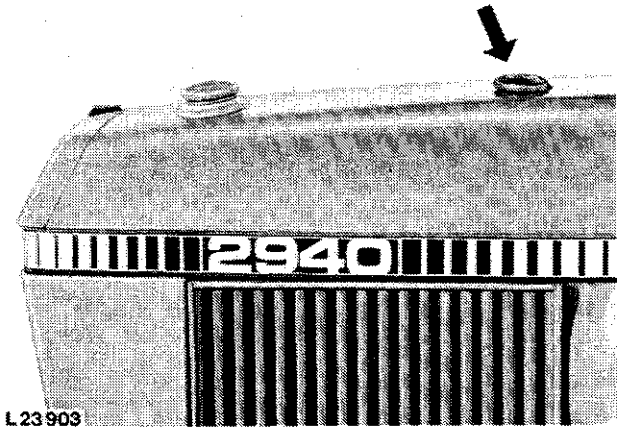



*Fig. 10 - Radiator Filler Cap*

1. Remove radiator filler cap and check coolant level. Coolant level must be midway between the filler neck and top of radiator core.

2. If necessary, add coolant to obtain this level. Use permanent-type, ethylene glycol antifreeze which contains a rust inhibitor but does not contain a stop leak-additive.

### Idle Speeds

1. Warm up engine to operating temperature and check slow and fast idle speeds. Adjust, if necessary (see Section 30, Group 30).

2. Slow idle speed: 750 rpm

3. Fast idle speed: 2660 rpm

### Hand Throttle Lever

1. Check whether hand throttle lever can be moved properly. Adjust, if necessary.

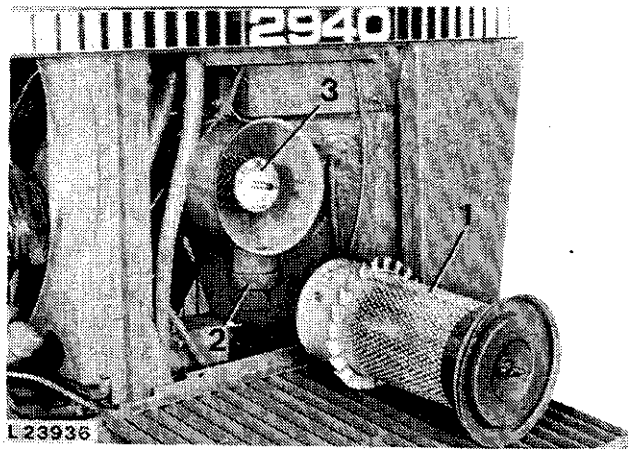
### Engine Shut-Off Cable

1. Check operation of shut-off cable. Move hand throttle lever completely forward and idle engine for 1 to 2 minutes.

2. Completely pull out shut-off knob, making sure engine stops immediately.

3. If necessary, adjust shut-off cable (see Section 30, Group 30).

### Air Cleaner and Safety Element




**1—Air Cleaner Element**
**2—Dust Unloading Valve**
**3—Safety Element**

*Fig. 11 - Air Cleaner and Safety Element*

1. Check air cleaner and safety elements for proper installation.

2. Make sure that dust unloading valve (2, Fig. 11) (rubber cap) is installed on air cleaner.

### Air Intake Connections

1. Check air intake connections for tightness. Tighten any loose clamps.

### CHECKING V-BELT TENSION

### Fan Belt

1. The fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

### Compressor Belt (if equipped)

1. Compressor belt should deflect 6 mm (1/4 in.) when a 70 N (15 lb) force is applied midway between pulleys.

## Electrical System

### Batteries

1. Check battery terminals and battery cable ends. If they are corroded, clean and coat them with petroleum jelly.

2. Check specific gravity of battery cells. At an electrolyte temperature of 20°C (68°F), a fully charged battery should have a specific gravity of 1.28 under normal and arctic conditions and 1.23 in tropical areas.

3. Check electrolyte level in each battery cell. Add distilled water if necessary to bring level above cell plates.

4. If batteries are not fully charged, charge them. Connect charger to positive starter cable and tractor frame. If using a fast charger, remove cell caps while charging.

### Important Notes

**1. If the engine is to be run for a short time without battery (using a slave battery for starting), do not, under any circumstances, interrupt the circuit by switching off the main switch before stopping the engine by means of the fuel pump shut-off cable. Further it is recommended to use additional current (lights) while engine is running. Do not run engine at a speed above 1000 rpm. Insulate battery end of disconnected starter cable properly to avoid damage to alternator and regulator. On tractors with Sound-Gard Body, do not connect ground strap of slave battery to cab.**

**2. Connect batteries or battery charger in the proper polarity. If they are improperly connected, the rectifier diodes will be immediately destroyed.**

### Neutral Safety Switch

1. Check operation of neutral safety switch.

2. If the starting motor does not work although the main switch is in starting position and the range shift lever is in neutral position, check the neutral safety switch by installing a new switch and check circuit (see Section 40, Group 15).

**IMPORTANT: Do not overtighten switch when installing it in the rockshaft housing. Tighten switch to maximum torque of 50 N·m (35 ft-lbs).**

### Lighting System

1. Check lighting system and repair as necessary. Replace any defective bulbs (see Section 40, Group 20).

2. Check headlight adjustment and correct, if necessary (see Section 40, Group 20).

### SOUND-GARD BODY CONTROLS

### Fan Switch

1. Open air outlets. Check fan switch (2, Fig. 12) for proper operation.

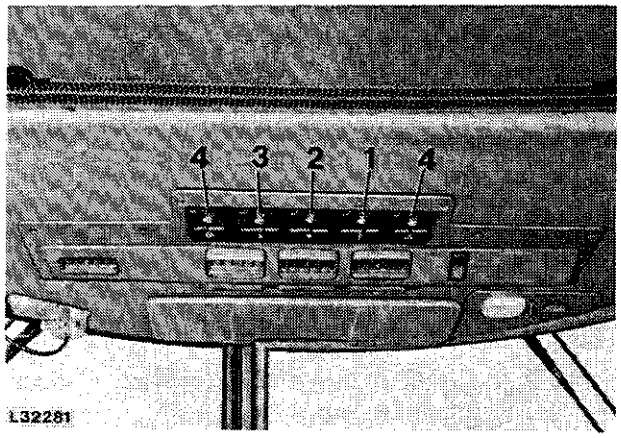
### Heater Switch

1. With fan operating, check heater switch (1, Fig. 12) for proper operation. For this purpose, turn switch clockwise, making sure that warm air enters cab (with engine at operating temperature).

If this is not the case, replace heater switch. If necessary, check coolant flow through heater core (see Section 90, Group 10).

### Thermostat Switch (Tractors with Air Conditioning)

1. With fan operating, check infinitely variable thermostat switch (if equipped) for proper operation. Turn off heater. Turn thermostat switch (3, Fig. 12) clockwise, making sure cool air enters cab. If switch does not operate correctly, see Section 90, Group 05.




1—Heater Switch
2—Fan Switch
3—Thermostat Switch (Air Conditioning)
4—Windshield Wiper Switch

*Fig. 12 - Sound-Gard Body Controls*

### Windshield Wiper Switch

1. Check windshield wiper switch for proper operation.

## Controls and Instruments

1. Check controls and instruments for proper operation.

## Power Train

### Checking Transmission/Hydraulic System Oil Level

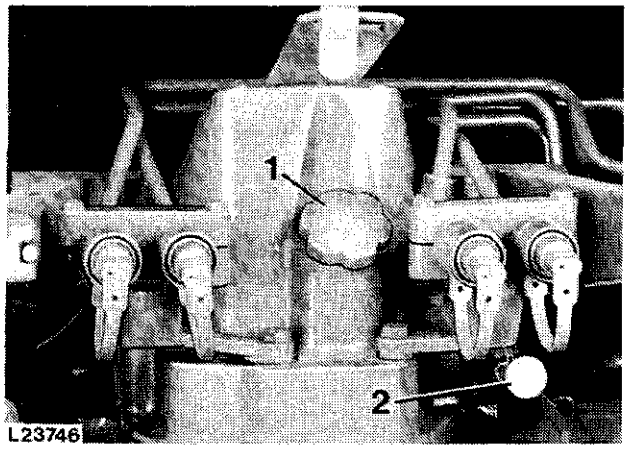
1. With the tractor on level ground, run the engine 2 to 3 minutes.

2. Place range and gear shift lever in neutral position.

3. Apply handbrake.

4. Lower draft links.

5. Run engine at slow idle (750 rpm).




1—Filler Cap
2—Dipstick

*Fig. 13 - Transmission/Hydraulic System Dipstick and Filler Cap*

6. Pull out dipstick and wipe clean.

7. Insert dipstick. Remove dipstick and check oil level.

8. If necessary, add John Deere HY-GARD Transmission and Hydraulic Oil or equivalent oil (see Group 10) to bring oil level to top mark on dipstick.

*NOTE: Types of oil not meeting our specifications will not give satisfactory service and may result in eventual damage.*

## Synchronized Transmission

1. Check transmission for proper operation.

2. While driving tractor, shift transmission through all gears. If transmission does not function properly, refer to Section 50, Group 30 and 35.

## Differential Lock

1. Check differential lock for proper operation. If you find any problem, refer to Section 50, Group 35.

## Independent PTO

1. Check PTO operation. For this purpose, run engine and move PTO control lever to engaged and disengaged position. If PTO does not operate properly, refer to Section 50, Group 45.

## Hi-Lo Shift Unit

Check Hi-Lo shift unit as follows:

1. Operate tractor in both high and low ranges, carefully observing both operations.

2. Use the brakes to simulate a load condition on the tractor.

3. Low oil pressure will be indicated by disk pack slippage, which causes the clutch pack to become noisy.

4. A mechanical failure in the Hi-Lo shift unit will also be indicated by unusual noise.

5. If you find any problems, refer to Section 50, Group 20.

## Clutch Pedal

### On Tractors Without SOUND-GARD BODY

1. Check clutch pedal free travel. It should be 25 mm (1 in.).

2. Make sure that clutch is fully disengaged before pedal contacts stop bracket. Adjust clutch pedal free travel, if necessary (see Section 50, Group 10).

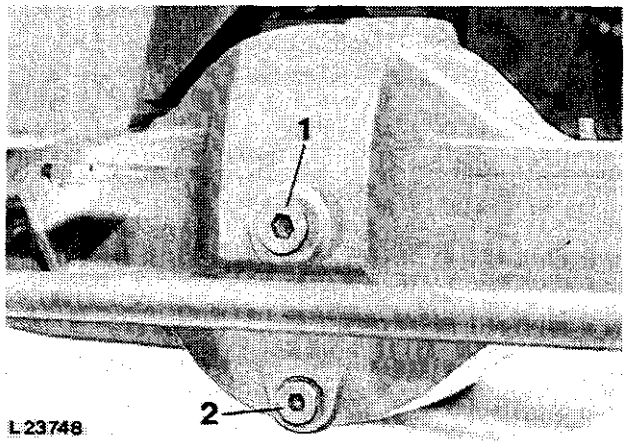
### On Tractors with SOUND-GARD BODY

1. Depress clutch pedal until it contacts stop. When doing this the operating rod should move 8.5 to 9.5 mm (0.33 to 0.37 in.) out of clutch operating cylinder.

2. When necessary, bleed clutch operating system (see Section 50, Group 10).

## Mechanical Front Wheel Drive

### Axle Housing Oil Change




**1—Level Plug** **2—Drain Plug**

*Fig. 14 - Axle Housing*

1. Remove drain plug (2, Fig. 14) and drain oil.

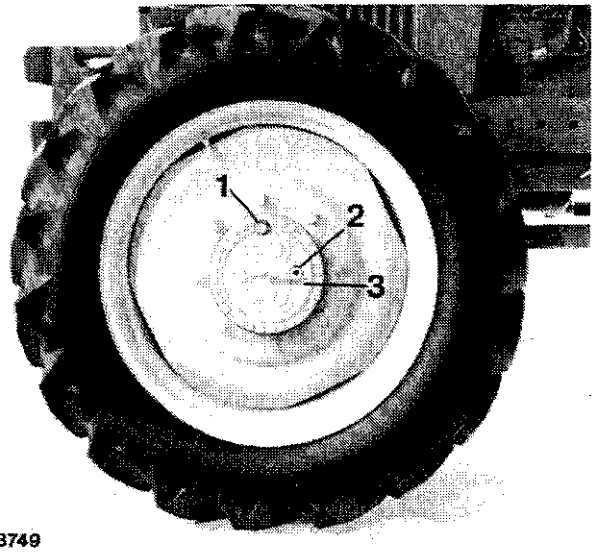
2. Reinstall drain plug and tighten securely.

3. Remove filler plug. Fill with fresh oil (6.5 liters; 1.7 U.S. gal.) up to level of plug bore. Reinstall filler plug.

### Final Drives Oil Change

1. Turn wheel until drain plug (1, Fig. 15) is at the bottom. Remove drain plug and drain oil.

2. Turn wheel 180° and fill with fresh oil (approx. 1 L; 0.30 U.S. gal.) through drain plug bore. Use EP transmission oil according to specifications given in Group 10 of this Section.

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1—Drain Plug
2—Level Plug
3—Oil Level Mark

*Fig. 15 - Final Drives*

3. Turn wheel until mark (3, Fig. 15) is in level position.

4. Remove level plug (2). Oil should be level with plug bore. Reinstall drain plug (1) and level plug (2).

*NOTE: Drain oil immediately after having operated the tractor for some time when the oil is still warm.*

### MFWD Operation

1. Check MFWD for proper operation. If you find any problems, refer to Section 50, Group 50.

## Steering and Brakes

### Steering

1. Check steering system for proper operation. In case of a malfunction, refer to Section 60, Group 05.

### Brakes

1. Check footbrakes and handbrake for proper operation. Adjust brakes, if necessary. Refer to Section 60, Group 10 if a malfunction occurs.

## Hydraulic System

### Rockshaft

1. Check rockshaft operation. In case of a malfunction, refer to Section 70, Group 20.

### Selective Control Valves

1. Check operation of selective control valves.

### Leaks

1. Check entire hydraulic system for leaks. Repair or replace components as necessary.

## Miscellaneous

### Guards

1. Check all guards for proper installation.

### ROLL-GARD Protective Structure

1. Check ROLL-GARD protective structure for proper installation.

2. Tighten cap screws to specified torque (see Section 90, Group 30).

3. If tractor is equipped with canopy, tighten canopy-to-ROLL-GARD cap screws to 115 N·m (85 ft-lbs).

## Sound-Gard Body

### Air Conditioning System

1. Check operation of air conditioning system. If you find any problems, refer to Section 90, Group 05.

2. Check refrigerant lines for leaks. Repair or replace parts as necessary.

### Operator's Seat

1. Check whether operator's seat can be adjusted properly.

2. Check seat belt for proper condition and correct installation.

### Sound-Gard Body

1. Check operator's cab for proper installation.

2. Tighten attaching cap screws to specified torque, see Section 90, Group 20.

# Group 10
# LUBRICATION AND SERVICE

Effective use of lubricating oils and greases is perhaps the most important step toward low upkeep costs, long tractor life, and satisfactory service. Use only lubricants specified in this section.

## ENGINE LUBRICATING OIL

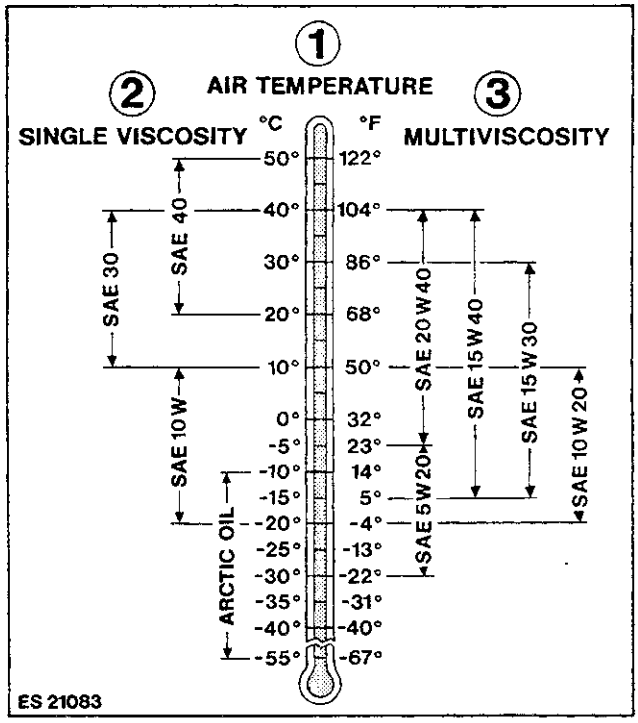



*Fig. 1 - Oil Viscosity at Expected Temperature*

*NOTE: Depending on the lowest expected atmospheric temperature at start for the fill period, use oil of viscosity as shown in Fig. 1.*

John Deere TORQ-GARD SUPREME® engine oil or John Deere HD Engine Oil is recommended. If other oils are used, they must be premium engine oils meeting performance requirements of:

— API Service Classification CD/SC
— Military Specification MIL-L-2104C

For low temperature operation, where oils meeting the above requirements may not be available in appropriate viscosity grade, oils meeting the performance requirements of API Service Classification CC/SC or Military Specification MIL-L-46152 or MIL-L-46167 (Arctic Oil) may be used but at shorter drain intervals.

Quality engine oils are blended, so additives are neither required nor recommended.

*NOTE: Some increase in oil consumption may be expected when SAE 5W-20 or Arctic Oils are used. Check oil level more frequently.*

## TRANSMISSION-HYDRAULIC OIL

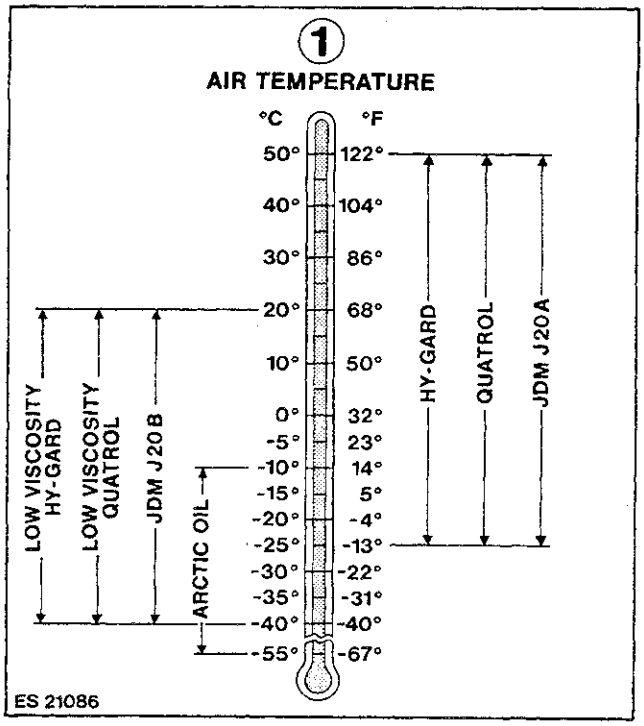



*Fig. 2 - Oil Viscosity at Expected Temperature*

John Deere HY-GARD ® transmission and hydraulic oil is recommended.

You may also use QUATROL ® oil, or other oils meeting John Deere Standard JDM J20A or JDM J20B.

For temperatures below -40°C (-40°F) use Arctic Oil (API-CC/SC, MIL-L-46167).

## Oil for Mechanical Front Wheel Drive

John Deere API GL-5 gear oil is recommended.

You may also use other EP transmission oils meeting performance requirements of:

—API Service Classification GL-5
—Military Specification MIL-L-2105B
—Military Specification MIL-L-2105C

At temperature below -35°C (-31°F) use Arctic Oil (API-CC/SC, MIL-L-46167).

## BRAKE FLUID FOR HYDRAULIC OPERATED CLUTCH

For tractors with hydraulic operated clutch (tractors with Sound Gard Body), use brake fluid meeting SAE standard J 1703.

## GREASE

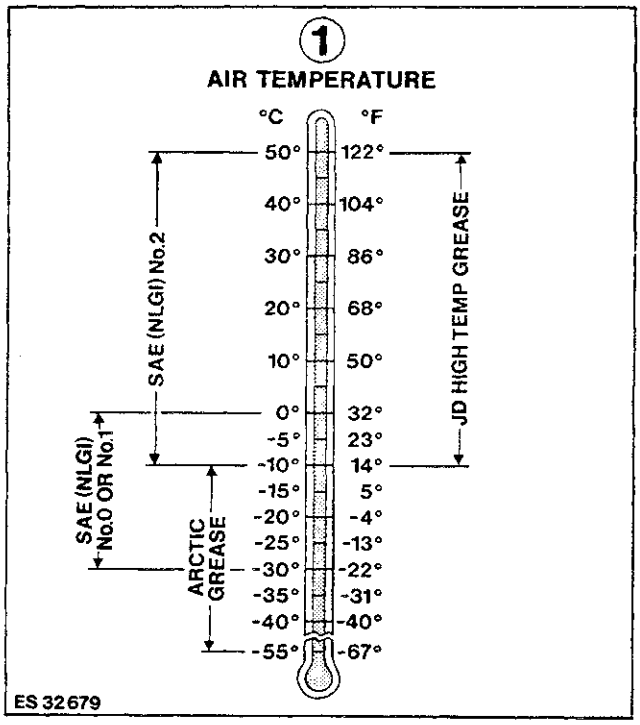



*Fig. 3 - Grease to be used at Expected Temperature*

John Deere High Temperature EP multipurpose Grease is recommended for all grease fittings. If other greases are used, use:

—SAE EP Multipurpose Grease

At temperatures below -30°C (-22°F) use Arctic Grease (MIL-G-10924 C).

Grease must be free of dust and other contamination.

Grease the tractor only when the engine is not running!

Clean grease fittings prior to greasing!

## STORING LUBRICANTS

The 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.

## 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 shows capacities for the various components.

| Component | Capacity | Service Interval |
|---|---|---|
| Engine crankcase | Without filter change: 11 liters (2.9 U.S. gal.) With filter change: 11.5 liters (3.0 U.S. gal.) | Every 10 operating hours: check oil level Every 100 operating hours: oil change Every 200 operating hours: filter change* |
| Transmission/hydraulic system (including oil reservoir and oil cooler) | Dry system: 68.0 liters (18.00 U.S. gal.) Oil change: 60.0 liters (15.9 U.S. gal.) | Every 50 operating hours: check oil level Every 500 operating hours: filter change** Every 1000 operating hours: oil change Every 1000 operating hours: Change hydrostatic steering filter Every 1000 operating hours: Clean hydraulic pump stroke control valve filter |
| Mechanical front wheel drive | Axle housing: 6.5 liters (1.7 U.S. gal.) Final drives: 1.0 liters (0.3 U.S. gal.) each | Every 100 operating hours: check oil level Every 1000 operating hours: oil change*** |
| Hydraulic operated clutch (tractors with Sound Gard Body) | 500 $cm^3$ (17.5 fl.oz.) | Change brake fluid every year |

** Replace crankcase filter element after the first 100 and 200 hours of operation. Thereafter replace filter element after every 200 hours of operation.*

*** Replace transmission/hydraulic filter element after the first 50 hours of operation, after the first 500 and thereafter every 500 hours of operation.*

**** On tractors with MFWD, first oil change after 100 hours of operation. Thereafter every 1000 hours of operation.*

| Component | Lubricant | Service Interval |
|---|---|---|
| Front wheel bearings | John Deere EP multipurpose grease or SAE EP multipurpose grease | Every 1000 operating hours: clean and pack with grease |
| Grease fittings | John Deere EP multipurpose grease or SAE EP multipurpose grease | |
| Front axle and front wheels | | Every 50 operating hours: lubricate |
| Rear axle bearings | | In extremely wet and muddy conditions: lubricate every 10 operating hours. Under normal conditions: lubricate every 500 operating hours |
| Three-point hitch | | Every 200 operating hours: lubricate |

## ENGINE CRANKCASE

### Checking Oil Level

With the tractor on level ground and the engine stopped for 10 minutes or more, check crankcase oil level. If the oil level is down to the lower mark on the dipstick, add sufficient John Deere TORQ-GARD SUPREME Engine Oil or its equivalent of the proper viscosity to bring the level to the upper mark.

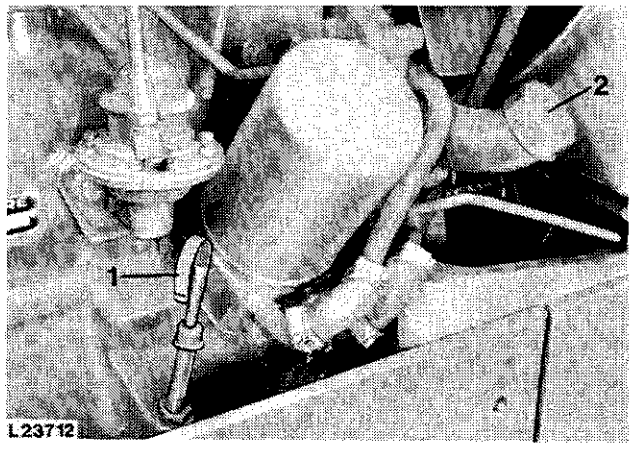
**Service Interval:** At predelivery and after every 10 hours.

### Oil and Filter Change

*NOTE: Drain oil with engine shut off, however, with engine oil warm.*

1. Remove drain plug.

2. While oil is draining, replace filter element (every 200 hours).




**1—Dipstick** **2—Filler Cap**

*Fig. 4 - Engine Oil Dipstick and Filler Cap*

3. Remove filter element (turn counterclockwise) and clean mounting surface.

4. Apply a thin film of oil to sealing ring of new filter. Tighten filter element until sealing ring touches mounting surface, then turn an additional 1/2 to 3/4 turn. Do not overtighten.

5. Reinstall drain plug.

6. Fill crankcase with fresh oil of the proper viscosity.

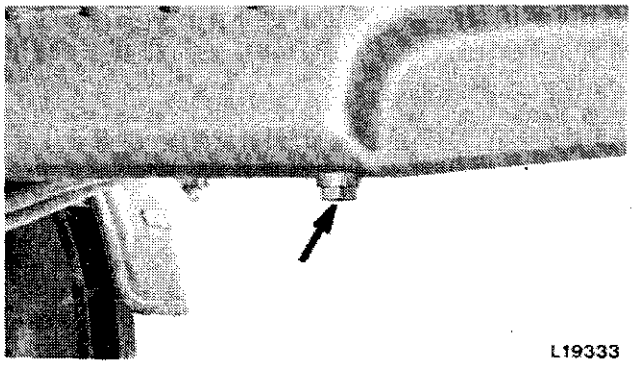



*Fig. 5 - Crankcase Drain Plug*

7. Crankcase capacity without filter change 11.0 L (2.9 U.S. gal.), with filter change 11.5 L (3.0 U.S. gal.)

8. Run engine for a short time and check for leaks at filter base and drain plug.

9. Stop engine.

10. Check oil level.

**IMPORTANT: During cold weather operation with temperature below freezing point, change oil every 100 hours or every six weeks, whichever occurs first. Also change oil at any seasonal change in temperature when oil of a new viscosity is required.**

**Service Interval:** Every 100 hours.

## TRANSMISSION/HYDRAULIC SYSTEM

### Checking Oil Level

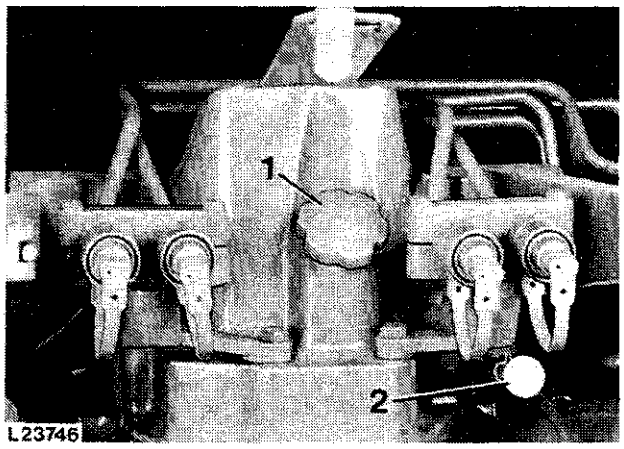
1. With the tractor on level ground, run the engine 2 to 3 minutes.

2. Place range and gear shift lever in neutral position.

3. Apply handbrake.

4. Lower draft links.

5. Run engine at slow idle (750 rpm).




**1—Filler Cap** **2—Dipstick**

*Fig. 6 - Transmission/Hydraulic System Dipstick and Filler Cap*

6. Pull out dipstick and wipe clean.

7. Insert dipstick. Remove dipstick and check oil level.

8. If necessary, add John Deere HY-GARD Transmission and Hydraulic Oil or equivalent oil to bring oil level to top mark on dipstick.

*NOTE: Types of oil not meeting our specifications will not give satisfactory service and may result in eventual damage.*

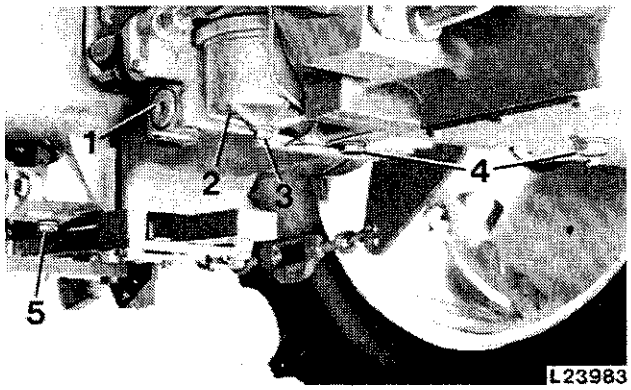
**Service Interval:** At predelivery and every 50 hours.

## Filter Change

### Transmission/Hydraulic Oil Filter

1. On tractors with hydraulic motor connection, remove return line from filter.

2. Remove retaining screw (3, Fig. 7) and lift out filter cover (2).




**1—Plug**
**2—Filter Cover**
**3—Retaining Screw**
**4—Front Drain Plug**
**5—Rear Drain Plug**

*Fig. 7 - Transmission/Hydraulic Oil Filter*

3. Remove element and packing.

4. Install new packing coated with grease in transmission case groove.

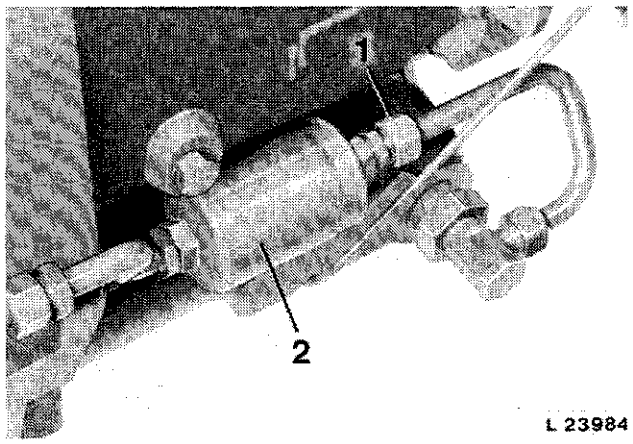
5. Insert new element and reinstall filter cover (2, Fig. 7).

6. Tighten retaining screw 3 to 75 N·m (55 ft-lbs) torque.

7. On tractors with hydraulic motor connection, connect return line.

**Service Interval:** After the first 50, after the first 500 and thereafter every 500 hours of operation.

### Hydrostatic Steering Filter (On Tractors Without Sound-Gard Body)




**1—Union Nut** **2—Filter**

*Fig. 8 - Hydrostatic Steering Filter*

1. Remove union nut (1, Fig. 8) from return line.

2. Unscrew filter (2) out of line.

3. Install new filter and tighten union nut.

**Service Interval:** Every 1000 hours.

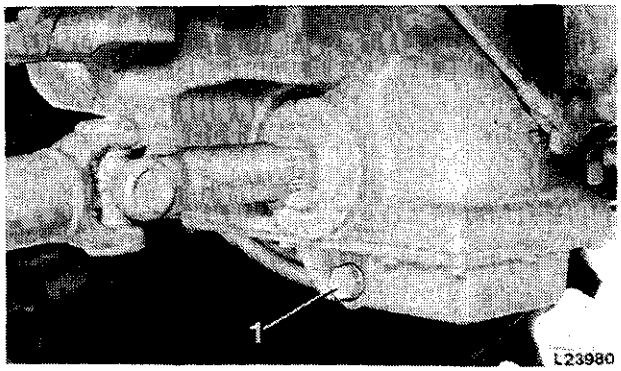
## Oil Change

1. Start engine and operate hydraulic functions to heat transmission oil to operating temperature.

2. Shut off engine.

3. Remove drain plugs (4 and 5, Fig. 7).

*NOTE: On tractors with MFWD, also remove drain plug (1, Fig. 9) from clutch housing.*




**1—Drain Plug**

*Fig. 9 - Clutch Housing Drain Plug (on Tractors with MFWD)*

4. Replace transmission/hydraulic system filter element (see Filter Change).

5. Remove plug (1, Fig. 7), pull out intake screen and wash in fuel.

6. On tractors without Sound Gard Body, replace hydrostatic steering filter (2, Fig. 8) (see Filter Change).

7. Remove hydraulic pump filter screen and clean. Reinstall filter screen and tighten plug.

8. Before filling with fresh oil, reinstall intake screen. Tighten drain plugs to 135 N·m (100 ft-lb) torque. Use new seal rings.

9. Refill system with transmission/hydraulic oil to top mark on dipstick.

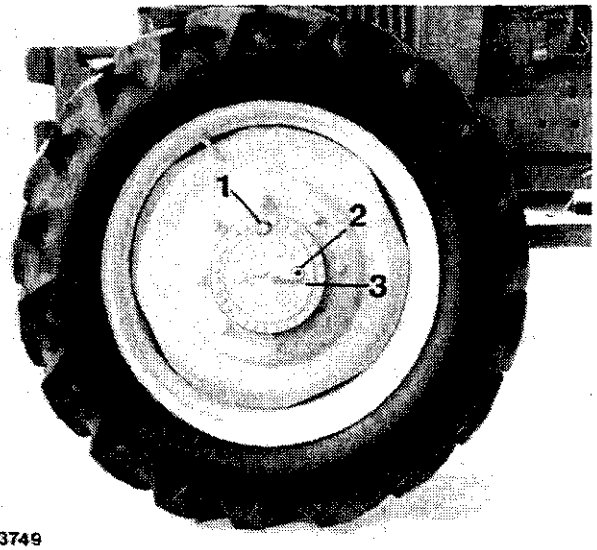
10. Run engine for 2 to 3 minutes, then recheck oil level.

11. Check oil level with engine running at slow idle, tractor standing on level ground, transmission in neutral, lift arms lowered and clutch engaged.

**Service Interval:** Every 1000 hours.

## MECHANICAL FRONT WHEEL DRIVE

### Checking Final Drives Oil Level




**1—Drain Plug**
**2—Level Plug**
**3—Oil Level Mark**

*Fig. 10 - Checking Final Drives Oil Level*

1. Turn wheel until mark (3, Fig. 10) is in level position.

2. Remove level plug (2). Oil should be level with plug bore.

3. Add oil, if necessary, using EP transmission oil according to specifications given on page 2.

### Checking Axle Housing Oil Level

1. Remove level plug (1, Fig. 11). Oil should be level with plug bore.

2. If necessary, top up with oil, using EP transmission oil according to specifications given on page 2.

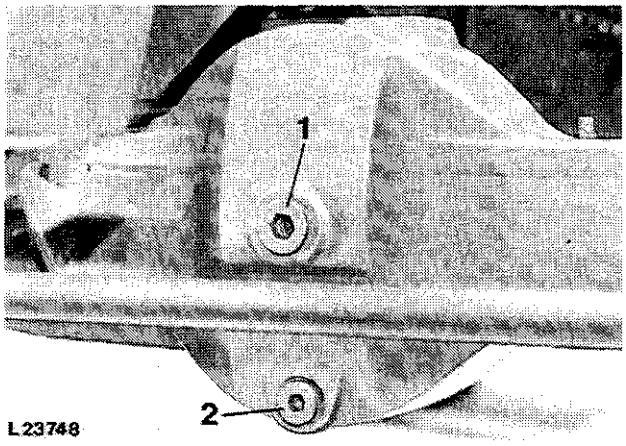
**Service Interval:** Every 100 hours.

## Axle Housing Oil Change

1. Remove drain plug (2, Fig. 11) and drain oil.

2. Reinstall drain plug and tighten securely.

3. Remove filler plug. Fill with fresh oil (6.5 liters; 1.7 U.S. gal.) up to level of plug bore. Reinstall filler plug.




**1—Level Plug** **2—Drain Plug**

*Fig. 11 - Axle Housing*

## Final Drives Oil Change

1. Turn wheel until drain plug (1, Fig. 10) is at the bottom. Remove drain plug and drain oil.

2. Turn wheel 180° and fill with fresh oil (approx. 1 L; 0.30 U.S. gal.) through drain plug bore. Use EP transmission oil according to specifications given on page 2.

3. Check oil level as described earlier. Reinstall drain plug and tighten securely.

*NOTE: Drain oil immediately after having operated the tractor for some time when the oil is still warm.*

**Service Interval:** Change oil every 1000 hours.

# FRONT WHEEL BEARINGS

## Cleaning and Packing Bearings

1. Jack up front axle.

2. Remove hub cap. Remove cotter pin and slotted nut.

3. Disassemble parts. Clean parts in solvent and blow them dry with compressed air.

4. Inspect parts carefully for damage. Replace bearings if they are worn. Replace oil seal and oil seal cup if grooves are worn in cup.

5. Pack bearings with wheel John Deere EP multipurpose grease or SAE EP multipurpose grease. Coat seal with John Deere EP multipurpose grease or its equivalent.

6. Reassemble parts. Tighten slotted nut until a slight drag is felt when wheel is turned. Back nut off just enough to insert cotter pin in first hole.

7. Reinstall hub cap.

**Service Interval:** Every 1000 hours.