2150 AND 2255 TRACTORS

JOHN DEERE

TECHNICAL MANUAL

2150 AND 2255
TRACTORS

TM4401 (01NOV87) English

JOHN DEERE WERKE MANNHEIM
TM4401 (01NOV87)

LITHO IN THE U.S.A.
ENGLISH

2150 AND 2255 TRACTORS TECHNICAL MANUAL TM-4401 (Nov-87)

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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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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 spare parts (excluding engine parts), quote all digits and letters of serial number stamped on the plate.

A plate showing the tractor type, transmission serial number, (and 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, and hydraulic pump have model numbers for positive identification.

ENGINE

Number of cylinders	3
Cylinder liner bore	106.5 mm (4.19 in.)
Stroke	110 mm (4.33 in.)
Displacement	2940 cm^3 (179 cu.in.)
Compression ratio	
2150 up to engine serial no. 554175CD and 2255 up to engine serial no. 570858CD	16.8 : 1
2150 from engine serial no. 554176 CD and 2255 from engine serial no. 570859 CD	17.4 : 1
Maximum torque	
2150 at 1400 rpm	
Up to engine serial no. 571078 CD	175 N·m (129 lb-ft)
From engine serial no. 571079 CD	185 N·m (136 lb-ft)
2255 at 1400 rpm	
Up to engine serial no. 581072 CD	185 N·m (136 lb-ft)
From engine serial no. 581073 CD	192 N·m (141 lb-ft)
Firing order	1 - 2 - 3

Valve clearance (engine hot or cold)

Intake valve	0.35 mm (0.004 in.)
Exhaust valve	0.45 mm (0.018 in.)

Fast idle speed ..... 2610—2660 rpm

Slow idle speed ..... 700—800 rpm

Rated engine speed ..... 2500 rpm

Working speed range ..... 1400—2500 rpm

PTO* horsepower at engine rated speed—2500 rpm

2150		
Up to engine serial no. 571078 CD	34 kW	45 hp
From engine serial no. 571079 CD	37 kW	50 hp
2255	37 kW	50 hp

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

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

COOLING SYSTEM

Type ..... Pressurized system with centrifugal pump

Temperature regulation ..... Thermostat

FUEL SYSTEM

Type ..... Direct injection

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

Fuel injection pump type ..... Distributor type

2150	
Up to engine serial no. 571078 CD	Roto Diesel Nr. R 3432 F 940
From engine serial no. 571079 CD	Rotor Diesel Nr. R 3432 F 830
2255	
Up to enginer serial no. 581072 CD	Rotor Diesel Nr. R 3432 F 830
From engine serial no. 581073 CD	Rotor Diesel Nr. R 3432 F 940

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

**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 per cent.*

ELECTRICAL SYSTEM

Batteries	1 or 2 x 12 volts, 55 ampere-hours
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

COLLAR SHIFT TRANSMISSION

Type	Helical gears
Gear selections	8 forward, 4 reverse speeds
Gear shifting	Two forward ranges, One reverse range

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 (Lo) speed	Pre-loaded cup springs
Shifting to normal (Hi) speed	Hydraulic

REVERSER

Type	Hydraulically controlled can be shifted under load, with "wet" disk clutches and brakes, planetary reverser unit
Gear selections	1 to 4
Increase in reverse gear speeds	Approx. 16 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 SHAFTS

Independent PTO — 540 RPM

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

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

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

Continuous — Running PTO — 540 RPM

Type ..... Independent of transmission, with engine dual-stage clutch

PTO SPEEDS (IN RPM) — WITHOUT REVERSER

Engine speed	540 rpm shaft
800	180
2400	540
2500	565
2660	600

PTO SPEEDS (IN RPM) — WITH REVERSER

Engine speed	540 rpm shaft
800	210
2075	540
2400	625
2500	650
2660	690

MECHANICAL FRONT WHEEL DRIVE

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

Control ..... Electrical/hydraulic solenoid switch

Engagement ..... Pre-loaded cup springs

Disengagement ..... Hydraulic

POWER STEERING ..... Hydraulically operated steering linkage

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 ..... 15800—16200 kPa 158—162 bar 2300—2350 psi

Operating pressure ..... 14000 kPa 140 bar 2050 psi

Hydraulic pump ..... 8-piston pump with variable displacement

CAPACITIES

Fuel tank	74 L	19.6 U.S. gal.
Cooling System	10.5 L	2.80 U.S. gal.
Engine crankcase		
Without filter change	6.5 L	1.7 U.S. gal.
With filter change	7 L	1.8 U.S. gal.

CAPACITIES - Continued

Transmission - Hydraulic system (including oil reservoir and oil cooler)		
Synchronized transmission		
Initial filling	59.0 L	15.6 U.S. gal.
Oil change	51.0 L	13.5 U.S. gal.
Collar shift transmission (with reverser)		
Initial filling	42.0 L	11.1 U.S. gal.
Oil change	34.0 L	9 U.S. gal.
Oil reservoir	4.0 L	1.1 U.S. gal.
Oil cooler	2.0 L	0.5 U.S. gal.
Mechanical front wheel drive		
Front axle housing	5.3 L	1.4 U.S. gal.
Wheel hub, each	0.75 L	0.2 U.S. gal.

TRAVEL SPEEDS ..... see Operator's Manual

FRONT AND REAR WHEELS

Tires, tread widths. tire pressures and ballast weights ..... see Operator's Manual

DIMENSIONS AND WEIGHTS ..... see Operator's Manual

PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS

ENGINE SPEEDS

Slow idle	700—800 rpm
Fast idle	2610—2660 rpm
Rated speed	2500 rpm

FAN BELT

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).

BATTERIES

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

CLUTCH PEDAL

Clutch pedal free travel	approx. 25 mm (1 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 lb-ft)
Front wheel rim to hub		
Tractors without MFWD	180 N·m	(130 lb-ft)
Tractors with MFWD	300 N·m	(220 lb-ft)
Axle knees to axle center, cap screws	400 N·m	(300 lb-ft)
Outer tie rod clamp		
Cap screw (1/2 in.)	110 N·m	(80 lb-ft)
Cap screw (M12)	90 N·m	(65 lb-ft)
Inner tie rod clamp		
Cap screw (3/8 in.)	40 N·m	(30 lb-ft)
Cap screw (M10)	55 N·m	(40 lb-ft)
Rear Wheels		
Tractors with steel wheel disks		
Rear wheels to rear axle	175 N·m	(130 lb-ft)
2-post ROLL-GARD protective structure		
Supports to crossbar, cap screws	230 N·m	(170 lb-ft)
Supports to final drives, cap screws and nuts	230 N·m	(170 lb-ft)

LUBRICATION AND SERVICE

CAPACITIES

Engine crankcase
- Without filter change ..... 6.5 L (1.70 U.S. gal.)
- With filter change ..... 7.0 L (1.80 U.S. gal.)

Transmission-Hydraulic system (including oil reservoir and oil cooler)

Synchronized transmission
- Initial filling ..... 59.0 L 15.60 U.S. gal.)
- Oil change ..... 51.0 L (13.50 U.S. gal.)

Collar shift transmission (with reverser)
- Initial filling ..... 42.0 L (11.10 U.S. gal.)
- Oil change ..... 34.0 L (9.00 U.S. gal.)

Mechanical front wheel drive
- Front axle housing ..... 5.3 L (1.40 U.S. gal.)
- Wheel hub each ..... 0.75 L (0.20 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
- 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
  - Clutch throw-out bearing grease fitting (when equipped) ..... every 100 hours
  - Mechanical front wheel drive universal-jointed shaft ..... every 50 hours
    - In wet and muddy conditions ..... every 10 hours
  - Front axle and front axle bearings ..... every 50 hours
    - In wet and muddy conditions ..... every 10 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

2150			
Up to engine serial no. 571078 CD		34 kW	(45 hp)
From engine serial no. 571079 CD		37 kW	(50 hp)
2255		37 kW	(50 hp)
Compression	2100 kPa	21 bar	300 psi
Slow idle			700—800 rpm
Fast idle			2610—2660 rpm
Rated engine speed			2500 rpm
Air intake system vacuum	3.5—6.0 kPa	35—60 mbar	(14—25 in. water head)
Air cleaner restriction warning switch closes at a vacuum of	5.5—6.5 kPa	55—65 mbar	(22—26 in. water head)
Blow-by at crankcase vent tube, max		2.1 m^3/h	(74 cu. ft./h)
Thermostat opens at		82°C	(180°F)
Radiator cap high pressure valve opens at	40—50 kPa	0.4—0.5 bar	(6—7 psi)
Radiator cap low pressure valve opens at	0—4 kPa	0—0.04 bar	(0—0.6 psi)

Fan Belt

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

**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		
front attaching cap screws (4 used)	230 N·m	(170 lb-ft)
Rear attaching cap screws (2 used)	180 N·m	(130 lb-ft)
Hydraulic pump drive shaft, cap screws	50 N·m	(35 lb-ft)
Jointed shaft flange to front axle drive hub (tractors with MFWD), cap screws	35 N·m	(25 lb-ft)
Drag link to bell crank or steering arm, slotted nuts*	75 N·m	(55 lb-ft)
Clutch housing to engine block		
Cap screws and hex nuts	230 N·m	170 ft-lb
Clutch housing to transmission case, cap screws	160 N·m	120 ft-lb
Transmission case drain plugs	135 N·m	100 ft-lb
Hydraulic lines retainer to clutch housing, cap screw	45 N·m	32 ft-lb
Final drive housings to transmission case, cap screws	120 N·m	85 ft-lb
Rockshaft housing to transmission case, cap screws	120 N·m	85 ft-lb
Rear wheels to rear axle	240 N·m	175 ft-lb
Rear fenders to final drive housings, hex. nuts	130 N·m	95 ft-lb
2-post roll guard to final drive housings	230 N·m	170 ft-lb
both supports to crossbar	230 N·m	170 ft-lb
Basic weight to front axle carrier, cap screws	400 N·m	300 ft-lb
Drawbar to transmission case, cap screws	120 N·m	85 ft-lb

**NOTE: If cotter pin cannot be inserted when tightening to the specified torque, turn nut to next slot and secure with cotter pin.*

ENGLISH TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is ± 20%.

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

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

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

METRIC TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is ±20%.

Bolt Diameter	Property Class 8.8*		Property Class 10.9*	
	lb-ft	N·m	lb-ft	N·m
M5	5	6	7	9
M6	8	10	11	15
M8	18	25	26	35
M10	37	50	52	70
M12	66	90	92	125
M16	166	225	229	310
M20	321	435	450	610
M24	554	750	775	1050

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

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

RECOMMENDED TORQUES IN N·m, AND LB-FT FOR PIPE AND HOSE CONNECTIONS

	with O-rings		with cone	
Thread size	**N·m**	**lb-ft**	**N·m**	**lb-ft**
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
7/18-14 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
1-5/18-12 UNC	110	80	190	140
1-7/8-12 UNC	150	110	220	160

SPECIAL TOOLS*

TUNE-UP

Tools	Description and Part No.	Use
 L30722	Compression tester kit (FKM 10021) D-14546BA	Checking engine compression

Fig. 1 - Compression Tester Kit

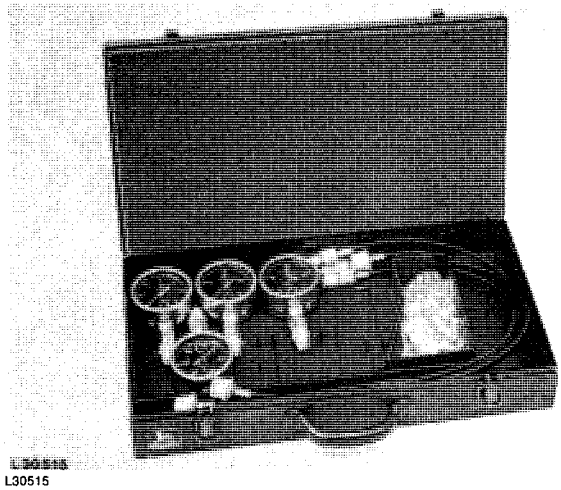
Tools	Description and Part No.	Use
 L30515	(FKM 10002) D-05022ST	Measuring air intake system vacuum

Fig. 2 - Pressure Gauge Set

*Tool numbers given in parenthesis are alternate tools available in Canada only. Otherwise order tools through your SERVICE-GARD™ catalog.

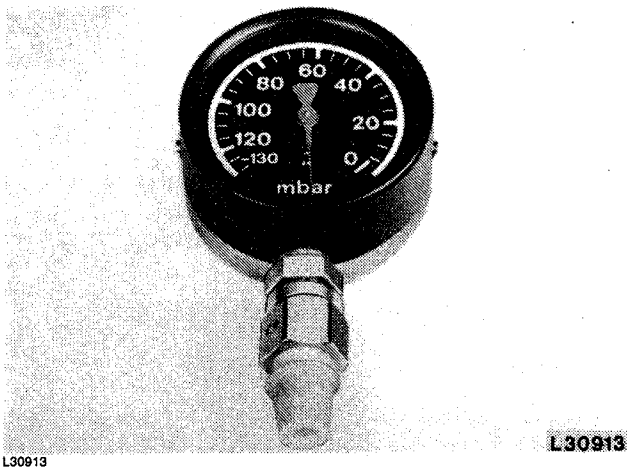
Tool	Description and Part No.	Use
 L30913	1 Vacuum gauge (FKM 10242) (D-05022 ST)	Measuring air intake system vacuum

Fig. 3 - Vacuum Gauge and Connectors

Tractor Separation

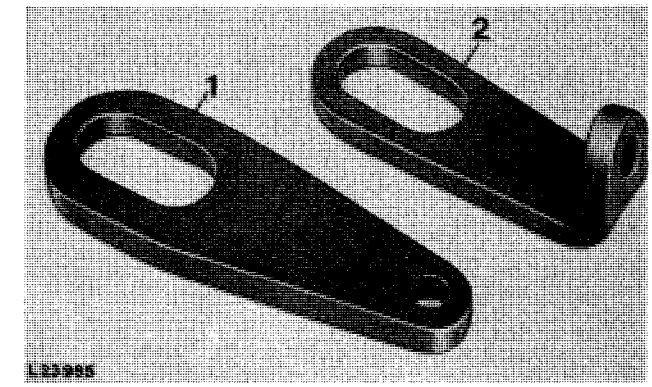
 L23985	1 Lifting eye, straight JD-244-1 2 Lifting eye, bent JD-244-2	Tractor separation

Fig. 4 - Lifting Eyes, Straight and Bent

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.

To promote complete customer satisfaction, a predelivery inspection including mending of possible shipping damage and giving the finishing touches to the tractor, is of prime importance to the dealer.

After the first 100 operating hours another inspection should be performed by the dealer to make sure the tractor is in proper operating condition.

The predelivery and after-sale inspection check lists in the operator's manual will be completed by the dealer when the inspections are being performed. He will then forward them to the sales branch service department.

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 220 cm^3 (7.5 oz.) of rust inhibitor to the engine oil.

2. Add 160 cm^3 (5.5 oz.) of rust inhibitor to the oil in the transmission/hydraulic system on tractors with collar shift transmission and 230 cm^3 (8 oz.) on tractors with synchronized transmission.

3. Drain fuel tank, pour 170 cm^3 (6 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 cm^3 (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. Slacken fan belt and air conditioning compressor belt (if equipped).

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 the 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 some 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:

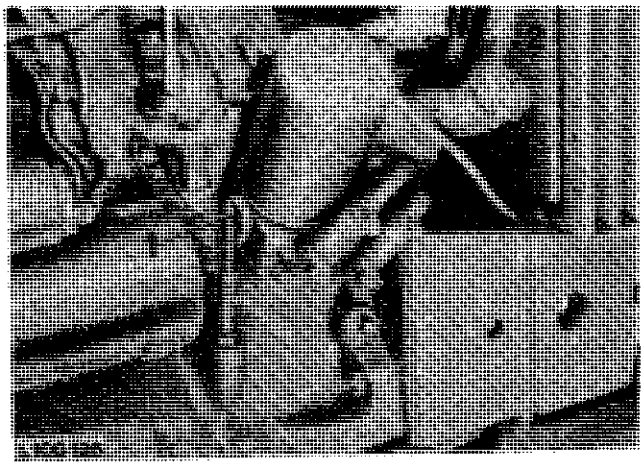
Engine

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.



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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

L10012 7

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.

John Deere Engine Cooling Fluid is filled into the cooling system at the factory. It protects the engine against corrosion and against frost down to −36°C (−35°F).

IMPORTANT: Use only John Deere Engine Cooling Fluid in the cooling system, independent of the season.

If no John Deere Engine Cooling Fluid is available use a mixture of 50 per cent ethylene-glycol antifreeze/anticorrosion inhibitor and 50 per cent clear, soft water. This mixture guarantees engine protection against corrosion and against frost down to −36°C (−35°F).

Never use any cooling system sealing additives.

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: 700 to 800 rpm.

3. Fast idle speed: 2610 to 2660 rpm.

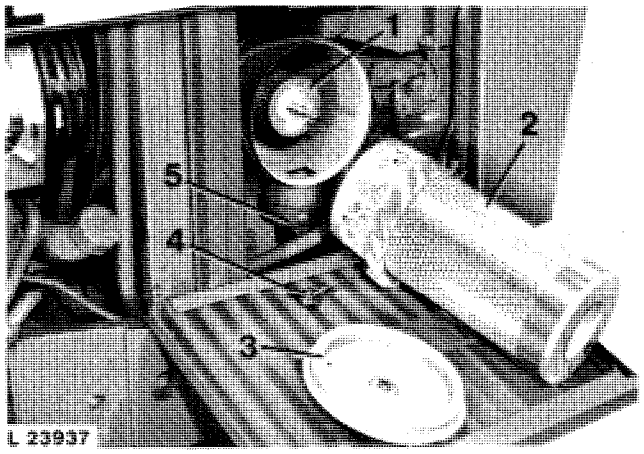
Engine Shut-Off Cable

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



L23937

1—Safety Element
2—Air Cleaner Element
3—Cover
4—Wing Nut
5—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 (5, Fig. 3) (rubber cap) is installed on air cleaner.

Air Intake Connections

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 with flap hinge at the rear (as seen in direction of forward travel). 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

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).

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. Remove cell caps before charging the battery.

IMPORTANT: 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 ("+" and "—"). If they are improperly connected, the rectifier diodes will be immediately destroyed.

Start Safety Switch

1. Move range shift lever into neutral position.

2. Check function of start safety switch. Replace switch when necessary (see Section 40, Group 15).

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).

Operator's Cab Controls

Fan Switch

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

Heater Switch

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).

Power Train

Checking Transmission/Hydraulic System Oil Level

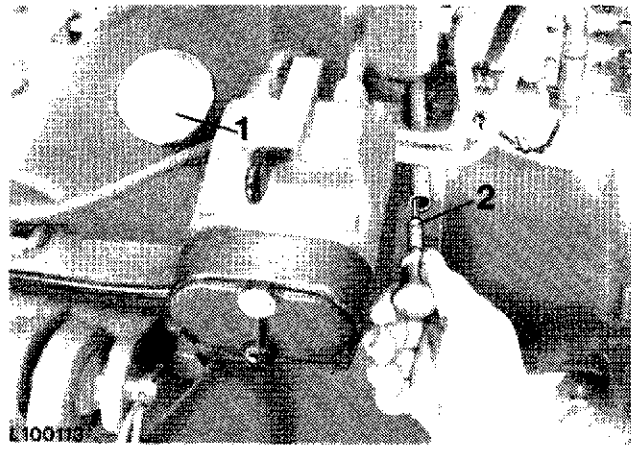
1. With the tractor on level ground, run the engine 2 to 3 minutes.

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

3. Apply handbrake.

4. Lower draft links.

5. Run engine at slow idle (700 to 800 rpm).

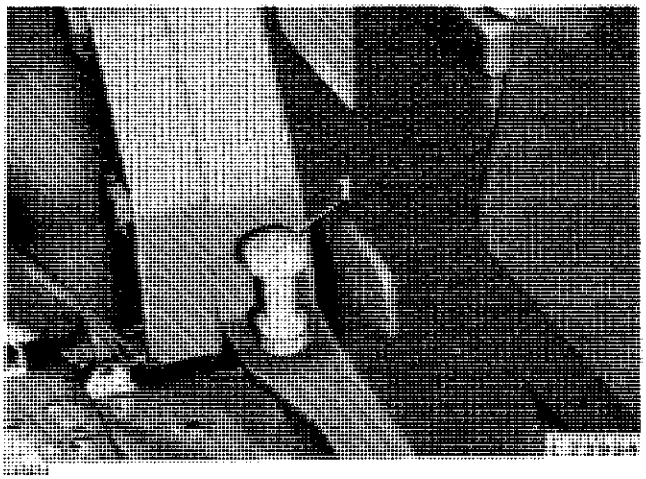


L100113

1—Filler Cap
2—Dipstick

Fig. 4 - Transmission/Hydraulic System Dipstick and Filler Cap (Tractors with Synchronized Transmission)

6. Pull out dipstick and wipe clean.



1—Dipstick

Fig. 5 - Transmission/Hydraulic System Dipstick (Tractors with Collar Shift Transmission)

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.

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 or 40.

Differential Lock

Check differential lock for proper operation. If you find any problem, refer to Section 50, Group 45.

PTO

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 55 or 60.

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.

Reverser Transmission

Check function of reverser transmission. If you find any problems, refer to Section 50, Group 25.

Clutch Pedal

Tractors without reverser transmission

1. Check clutch pedal free travel. It should be approx. 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).