

2150 AND 2255 TRACTORS

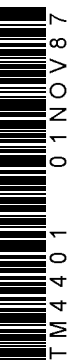


TECHNICAL MANUAL 2150 AND 2255 TRACTORS

TM4401 (01NOV87) English

JOHN DEERE WERKE MANNHEIM
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ENGLISH



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

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Section 10 GENERAL

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Group 00

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
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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 engine 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.)
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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 $\pm 20\%$.

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 $\pm 20\%$.

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.

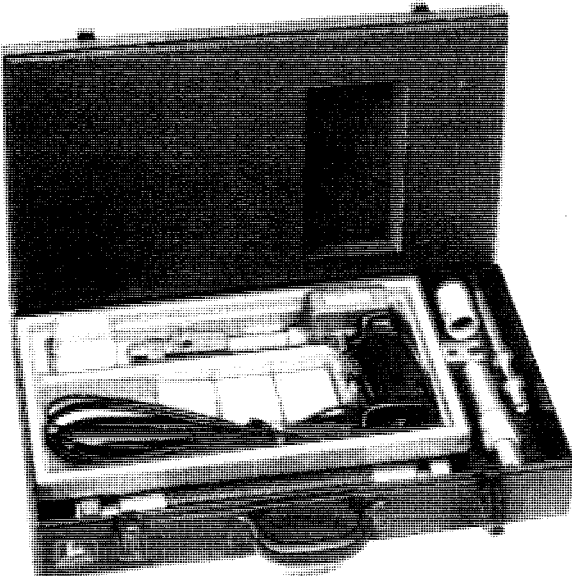
* Torque value for bolts and cap screws are identified by their property class head markings.

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

Thread size	with O-rings		with cone	
	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
7/8-14 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

SPECIAL TOOLS*

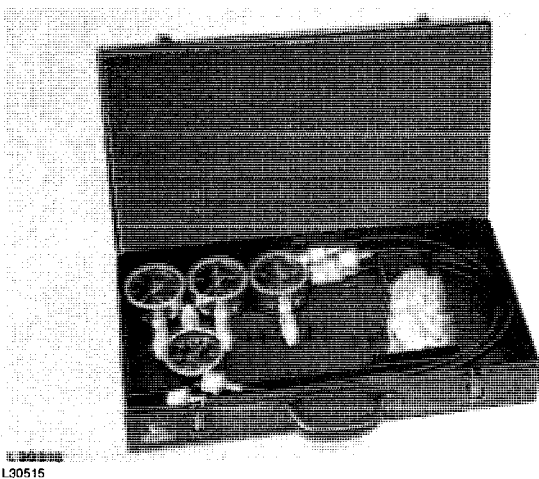
TUNE-UP

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

L30722

L30722

Fig. 1 - Compression Tester Kit



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.