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2021

Test 2231: John Deere 8R 250

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2231-SUMMARY 1183

JOHN DEERE 8R 250 DIESEL

e23 TRANSMISSION

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption		Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)	
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1052 rpm)						
225.37 (168.06)	2099	12.01 (45.48)	0.373 (0.227)	18.76 (3.70)	0.46 (1.72)	Fuel used during active exhaust regeneration-1.06 gal (4.02 l) (see note 1, p.2)
Standard Power Take-off Speed(1000 rpm)						
248.20 (185.08)	1995	12.73 (48.20)	0.359 (0.218)	19.49 (3.84)	0.47 (1.80)	
Maximum Power (1 hour)						
255.36 (190.42)	1700	12.49 (47.27)	0.342 (0.208)	20.45 (4.03)	0.50 (1.89)	

VARYING POWER AND FUEL CONSUMPTION

225.37 (168.06)	2099	12.01 (45.48)	0.373 (0.227)	18.76 (3.70)	0.46 (1.72)	Air temperature
196.53 (146.56)	2154	11.01 (41.67)	0.392 (0.238)	17.85 (3.52)	0.40 (1.52)	71°F (22°C)
148.09 (110.43)	2166	9.01 (34.12)	0.426 (0.259)	16.43 (3.24)	0.29 (1.09)	Relative humidity
99.27 (74.03)	2178	7.22 (27.33)	0.509 (0.310)	13.75 (2.71)	0.19 (0.70)	43%
49.91 (37.22)	2188	5.46 (20.69)	0.766 (0.466)	9.13 (1.80)	0.12 (0.46)	Barometer
1.20 (0.90)	2198	4.33 (16.37)	25.175 (15.313)	0.28 (0.05)	0.16 (0.59)	28.38" Hg (96.10 kPa)

Maximum Torque - 844 lb.-ft. (1144 Nm) at 1550 rpm

Maximum Torque Rise - 49.7%

Torque rise at 1680 engine rpm - 41%

Power increase at 1700 engine rpm - 13.3%

DRAWBAR PERFORMANCE

UNBALLASTED - FRONT DRIVE ENGAGED FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	D.E.F. Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
Power at Rated Engine Speed—9th Gear-Manual mode										
200.51 (149.52)	16177 (71.96)	4.65 (7.48)	2099	3.3	0.418 (0.254)	16.74 (3.30)	0.023 (0.014)	209 (98)	41 (5)	28.82 (97.60)
75% of Pull at Rated Engine Speed—9th Gear-Manual mode										
155.33 (115.83)	12095 (53.80)	4.82 (7.76)	2159	2.4	0.453 (0.276)	15.45 (3.04)	0.025 (0.015)	209 (98)	43 (6)	28.82 (97.60)
50% of Pull at Rated Engine Speed—9th Gear-Manual mode										
104.69 (78.07)	8044 (35.78)	4.88 (7.85)	2172	1.7	0.531 (0.323)	13.19 (2.60)	0.019 (0.011)	207 (97)	44 (7)	28.82 (97.60)
75% of Pull at Reduced Engine Speed—5.0 mph (8.0 km/h) Auto mode										
155.33 (115.83)	12178 (54.17)	4.78 (7.69)	1378	2.5	0.391 (0.238)	17.88 (3.52)	0.011 (0.007)	207 (97)	44 (7)	28.82 (97.60)
50% of Pull at Reduced Engine Speed—5.1 mph (8.2 km/h) Auto mode										
104.72 (78.09)	7947 (35.35)	4.94 (7.95)	1412	1.7	0.420 (0.255)	16.68 (3.29)	0.013 (0.008)	205 (96)	44 (7)	28.82 (97.60)

Location of tests: Nebraska Tractor Test Laboratory,
University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of tests: April 6 - 28, 2021

Manufacturer: John Deere Tractor Works, 3500
East Donald St., P.O. Box 270, Waterloo Ia,
50704-0270

CONSUMABLE Fluids, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8404 **Fuel weight** 6.998 lbs/gal (0.839 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE 10W-30 API service classification CK-4 Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere Hy-Gard fluid **Total time engine was operated:** 21.5 hours

ENGINE: Make John Deere **Diesel Type** six cylinder vertical with turbocharger, air to air aftercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** *RG6090U094226* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.661" x 5.354" (118.4 mm x 136.0 mm) **Compression ratio** 16.0 to 1 **Displacement** 548 cu in (8984 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and water separator **Fuel cooler** radiator for pump return fuel **Exhaust** DOC (diesel oxidation catalyst), SCR (selective catalyst reduction) and regenerative DPF (diesel particulate filter) integrated within a vertical muffler **Cooling medium temperature control** thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 78.7 - 84.9 lb/h (35.7 - 38.5 kg/h) **High idle:** 2190 - 2210 rpm **Turbo boost:** nominal 18.1 - 21.0 psi (125 - 145 kPa) as measured 19.7 psi (136 kPa)

CHASSIS: Type front wheel assist with duals **Serial No.** *1RW8250DEL B180201* **Tread width** rear 60.0" (1524 mm) to 127.9" (3248 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) **Wheelbase** 120.1" (3050 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled power shift **Nominal travel speeds mph(km/h)** first 1.49 (2.40) second 1.73 (2.78) third 2.00 (3.22) fourth 2.32 (3.74) fifth 2.69 (4.33) sixth 3.12 (5.03) seventh 3.59 (5.77) eighth 4.16 (6.70) ninth 4.82 (7.75) tenth 5.58 (8.98) eleventh 6.47 (10.42) twelfth 7.49 (12.06) thirteenth 8.70 (14.00) fourteenth 9.99 (16.08) fifteenth 11.60 (18.67) sixteenth 13.22 (21.27)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED
MANUAL MODE - 2100 ENGINE RPM

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
					5th Gear					
168.75 (125.84)	26689 (118.72)	2.38 (3.82)	2151	13.9	0.480 (0.292)	14.58 (2.87)	0.031 (0.019)	208 (98)	41 (5)	28.96 (98.07)
					6th Gear					
188.93 (140.88)	24926 (110.87)	2.84 (4.57)	2100	8.8	0.444 (0.270)	15.77 (3.11)	0.028 (0.017)	208 (98)	42 (6)	28.97 (98.09)
					7th Gear					
194.49 (145.03)	21598 (96.07)	3.38 (5.44)	2100	5.7	0.429 (0.261)	16.33 (3.22)	0.026 (0.016)	209 (98)	42 (6)	28.95 (98.04)
					8th Gear					
198.77 (148.22)	18764 (83.46)	3.97 (6.39)	2099	4.5	0.421 (0.256)	16.63 (3.28)	0.025 (0.015)	208 (98)	44 (7)	28.94 (97.99)
					9th Gear					
200.51 (149.52)	16177 (71.96)	4.65 (7.48)	2099	3.3	0.418 (0.254)	16.74 (3.30)	0.023 (0.014)	209 (98)	41 (5)	28.82 (97.60)
					10th Gear					
200.26 (149.33)	13893 (61.80)	5.41 (8.70)	2100	2.9	0.418 (0.254)	16.74 (3.30)	0.023 (0.014)	209 (98)	41 (5)	28.82 (97.60)
					11th Gear					
198.44 (147.97)	11812 (52.54)	6.30 (10.14)	2099	2.4	0.421 (0.256)	16.62 (3.27)	0.024 (0.015)	209 (98)	42 (6)	28.82 (97.60)
					12th Gear					
197.93 (147.60)	10150 (45.15)	7.31 (11.76)	2100	2.1	0.422 (0.257)	16.59 (3.27)	0.025 (0.015)	208 (98)	42 (6)	28.82 (97.60)
					13th Gear					
196.15 (146.27)	8632 (38.40)	8.52 (13.71)	2101	1.8	0.426 (0.259)	16.42 (3.23)	0.025 (0.015)	208 (98)	43 (6)	28.82 (97.60)

seventeenth 15.35 (24.70) eighteenth 17.78 (28.61) nineteenth 20.64 (33.22) twentieth 23.89 (38.44) twenty-first 26.10 (42.00) twenty-second 26.10 (42.00) twenty-third 26.10 (42.00) (electronically limited) reverse 1.79 (2.88), 2.41 (3.88), 3.24 (5.21), 4.32 (6.95), 4.99 (8.03), 6.71 (10.80), 9.02 (14.51), 12.02 (19.35), 15.91 (25.60), 18.64 (30.00), 18.64 (30.00) (electronically limited) **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 1000 rpm at 1995 engine rpm **Unladen tractor mass** 27405 lb (12431 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: The manufacturer declares that the average time between active regenerations is 40 hours. A 1% power decrease was observed during the active regeneration.

NOTE 2: The John Deere 8R 250 T.E.C.U. (Tractor Electronic Control Unit) is compliant with ISOBUS 11783.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 2231, Nebraska Summary 1183, October 19, 2021.

Roger M. Hoy
 Director

P.J. Jasa
 J.D. Luck
 S. Pitla
 Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 9th gear	69.3	69.1
Transport speed - no load - 20th gear		70.4
Bystander in 20th gear		86.1

Horizontal distance of drawbar hitch point behind rear wheel axis - 48.7" (1237 mm)

TIRES AND WEIGHT

Rear Tires - No., size, ply & psi (kPa)
Front Tires - No., size, ply & psi (kPa)
Height of Drawbar
Static Weight with operator - Rear
 - Front
 - Total

Tested Without Ballast

Four 480/80R50;***;10(70)
 Two 420/85R34;***;26(180)
 21.0 in (535 mm)
 16035 lb (7273 kg)
 11545 lb (5237 kg)
 27580 lb (12510 kg)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED - AUTO MODE
(Loads based on 2100 engine rpm manual mode performance runs)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3.1 mph (5.0 km/h)										
186.84 (139.32)	24857 (110.57)	2.82 (4.53)	1552	8.3	0.404 (0.246)	17.32 (3.41)	0.015 (0.009)	207 (97)	43 (6)	28.96 (98.05)
3.6 mph (5.8 km/h)										
194.43 (144.99)	21654 (96.32)	3.37 (5.42)	1556	5.5	0.389 (0.236)	18.01 (3.55)	0.015 (0.009)	208 (98)	44 (7)	28.94 (98.00)
4.2 mph (6.8 km/h)										
198.01 (147.65)	18608 (82.77)	3.99 (6.42)	1573	4.6	0.388 (0.236)	18.05 (3.56)	0.015 (0.009)	208 (98)	45 (7)	28.92 (97.93)
4.8 mph (7.8 km/h)										
200.19 (149.28)	16215 (72.13)	4.63 (7.45)	1555	3.3	0.385 (0.234)	18.18 (3.58)	0.014 (0.009)	208 (98)	41 (5)	28.82 (97.60)
5.6 mph (9.0 km/hr)										
200.43 (149.46)	14022 (62.37)	5.36 (8.63)	1550	3.0	0.383 (0.233)	18.29 (3.60)	0.014 (0.008)	208 (98)	42 (6)	28.82 (97.60)
6.6 mph (10.6 km/h)										
197.97 (147.63)	11696 (52.02)	6.35 (10.22)	1574	2.4	0.381 (0.232)	18.36 (3.62)	0.014 (0.009)	207 (97)	42 (6)	28.82 (97.60)
7.6 mph (12.2 km/h)										
197.93 (147.59)	10141 (45.11)	7.32 (11.78)	1576	2.1	0.387 (0.235)	18.09 (3.56)	0.015 (0.009)	208 (98)	42 (6)	28.82 (97.60)
8.8 mph (14.2 km/h)										
196.63 (146.62)	8626 (38.37)	8.55 (13.76)	1580	1.8	0.389 (0.237)	17.97 (3.54)	0.015 (0.009)	208 (98)	43 (6)	28.82 (97.60)

**DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED
MANUAL MODE - 1700 ENGINE RPM**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med bulb	Air dry bulb	Barom. inch Hg (kPa)
					5th Gear					
168.22 (125.44)	26608 (118.36)	2.38 (3.82)	2152	14.0	0.482 (0.293)	14.51 (2.86)	0.030 (0.019)	208 (98)	41 (5)	28.96 (98.07)
					6th Gear					
188.87 (140.84)	24800 (110.31)	2.86 (4.60)	2100	8.4	0.444 (0.270)	15.76 (3.11)	0.027 (0.016)	208 (98)	42 (6)	28.96 (98.07)
					7th Gear					
205.02 (152.88)	24157 (107.46)	3.19 (5.13)	2019	7.5	0.429 (0.261)	16.30 (3.21)	0.023 (0.014)	209 (98)	43 (6)	28.95 (98.04)
					8th Gear					
217.26 (162.01)	22902 (101.87)	3.56 (5.73)	1912	6.1	0.409 (0.249)	17.11 (3.37)	0.019 (0.012)	210 (99)	44 (7)	28.93 (97.97)
					9th Gear					
223.45 (166.63)	21721 (96.62)	3.86 (6.21)	1782	5.7	0.391 (0.238)	17.90 (3.53)	0.018 (0.011)	209 (98)	45 (7)	28.92 (97.93)
					10th Gear					
225.39 (168.07)	19644 (87.38)	4.30 (6.92)	1700	4.8	0.388 (0.236)	18.04 (3.55)	0.017 (0.010)	209 (98)	45 (7)	28.92 (97.93)
					11th Gear					
224.22 (167.20)	16717 (74.36)	5.03 (8.10)	1700	3.9	0.388 (0.236)	18.03 (3.55)	0.019 (0.012)	211 (99)	45 (7)	28.92 (97.93)
					12th Gear					
227.39 (169.56)	14582 (64.86)	5.85 (9.41)	1700	3.4	0.383 (0.233)	18.28 (3.60)	0.018 (0.011)	209 (98)	45 (7)	28.92 (97.93)
					13th Gear					
227.05 (169.31)	12489 (55.55)	6.82 (10.98)	1700	2.9	0.383 (0.233)	18.26 (3.60)	0.019 (0.011)	209 (98)	45 (7)	28.91 (97.90)
					14th Gear					
225.17 (167.91)	10744 (47.79)	7.86 (12.65)	1700	2.6	0.385 (0.234)	18.15 (3.58)	0.019 (0.011)	209 (98)	46 (8)	28.91 (97.88)
					15th Gear					
220.16 (164.17)	9018 (40.11)	9.16 (14.73)	1701	2.3	0.396 (0.241)	17.68 (3.48)	0.020 (0.012)	210 (99)	46 (8)	28.90 (97.87)

HYDRAULIC PERFORMANCE

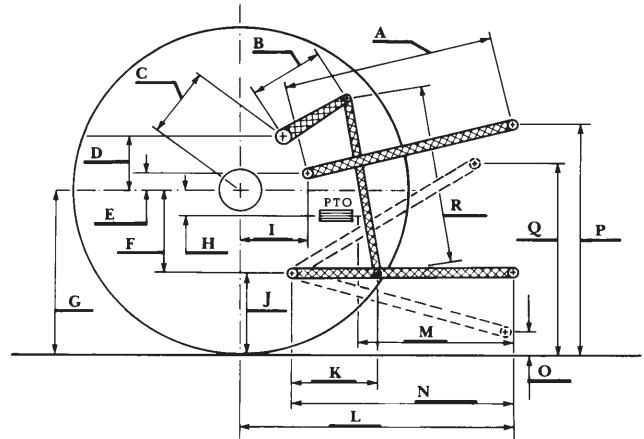
CATEGORY: IVN
Quick Attach: Yes
OECD Static test

	<u>Lift cylinders</u>	
Maximum force exerted through whole range:	15229 lbs (67.7 kN) 2x100 mm	18869 lbs (83.9 kN) 1x100 mm & 1x115 mm
	20254 lbs (90.1 kN) 2x115 mm	
<hr/>		
	<u>85 cc pump</u>	<u>85 cc and 35cc pumps combined</u>
i) Sustained pressure at compensator cutoff:	2850 psi (196 bar)	2915 psi (201 bar)
three outlet sets combined		
ii) Pump delivery rate at minimum pressure and rated engine speed:	61.2 GPM(231.6l/min)	86.0 GPM(325.4l/min)
iii) Pump delivery rate at maximum hydraulic power:	61.3 GPM(231.9l/min)	80.5 GPM(304.8l/min)
Delivery pressure:	2371 psi (163 bar)	2239 psi (154 bar)
Power:	84.7 HP (63.2 kW)	105.2 HP (78.5 kW)
<hr/>		
	<u>single outlet set</u>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	<u>1/2" couplers</u>	<u>3/4" couplers</u>
	36.9 GPM(142.2l/min)	43.2 GPM(163.3 l/min)
iii) Pump delivery rate at maximum hydraulic power:	36.1 GPM(136.7l/min)	41.9 GPM(158.5 l/min)
Delivery pressure:	2141 psi (148 bar)	2309 psi (159 bar)
Power:	45.1 HP (33.6 kW)	56.4 HP (42.1 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.5	725
B	20.5	520
C	20.9	532
D	18.9	480
E	12.0	304
F	14.4	365
G	38.2	970
H	9.1	230
I	23.6	599
J	23.8	605
K	28.7	730
L	52.8	1340
*L'	58.7	1490
M	25.9	657
N	40.1	1019
O	9.1	230
P	50.1	1272
Q	41.5	1055
R	45.7	1160

*L' to Quick Attach ends



RECOMMENDED CITATION FORMAT:

NTTL.(2021). Nebraska OECD tractor test 2231 for John Deere 8R 250 e23 Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



JOHN DEERE 8R 250 DIESEL

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln