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2021

Test 2236: John Deere 8RX 310

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2236–SUMMARY 1188

JOHN DEERE 8RX 310 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.l/l)	Gal/hr (l/h)	
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1053 rpm)						
284.84 (212.41)	2101	14.65 (55.47)	0.360 (0.219)	19.44 (3.83)	0.59 (2.23)	Fuel used during active exhaust regeneration-1.16 gal (4.39 l) (see note 1, p.2)
Standard Power Take-off Speed(1000 rpm)						
309.18 (230.56)	1995	15.49 (58.62)	0.351 (0.213)	19.97 (3.93)	0.63 (2.38)	
Maximum Power (1 hour)						
320.12 (238.71)	1700	15.62 (59.13)	0.341 (0.208)	20.49 (4.04)	0.58 (2.18)	

VARYING POWER AND FUEL CONSUMPTION

284.84 (212.41)	2101	14.65 (55.47)	0.360 (0.219)	19.44 (3.83)	0.59 (2.23)	Air temperature
248.57 (185.36)	2154	13.29 (50.32)	0.374 (0.228)	18.70 (3.68)	0.58 (2.21)	71°F (22°C)
187.20 (139.60)	2165	10.69 (40.47)	0.400 (0.243)	17.51 (3.45)	0.43 (1.63)	Relative humidity
125.43 (93.53)	2176	8.23 (31.17)	0.459 (0.279)	15.23 (3.00)	0.25 (0.94)	22%
62.55 (46.65)	2188	5.97 (22.60)	0.668 (0.406)	10.48 (2.06)	0.14 (0.52)	Barometer
1.08 (0.81)	2199	4.43 (16.78)	28.677 (17.444)	0.24 (0.05)	0.14 (0.54)	28.98" Hg (98.13 kPa)

Maximum Torque - 1053 lb.-ft. (1428 Nm) at 1551 rpm
 Maximum Torque Rise - 47.9%
 Torque rise at 1680 engine rpm - 41%
 Power increase at 1700 engine rpm - 12.4%

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 lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing dry med bulb	Barom. inch Hg (kPa)
Power at Rated Engine Speed—9th Gear-Manual mode								
237.68 (177.23)	20451 (90.97)	4.36 (7.02)	2100	2.7	0.431 (0.262)	16.25 (3.20)	0.025 (0.015)	208 (98)
75% of Pull at Rated Engine Speed—9th Gear-Manual mode								
184.88 (137.87)	15283 (67.98)	4.54 (7.31)	2159	1.5	0.457 (0.278)	15.31 (3.02)	0.026 (0.016)	209 (98)
50% of Pull at Rated Engine Speed—9th Gear-Manual mode								
124.59 (97.90)	10180 (45.28)	4.59 (7.39)	2170	0.8	0.534 (0.325)	13.12 (2.58)	0.024 (0.015)	208 (98)
75% of Pull at Reduced Engine Speed—4.6 mph (7.4 km/h) Auto mode								
184.83 (137.82)	15240 (67.79)	4.55 (7.32)	1391	1.5	0.411 (0.250)	17.04 (3.36)	0.016 (0.010)	207 (97)
50% of Pull at Reduced Engine Speed—4.6 mph (7.4 km/h) Auto mode								
124.67 (92.97)	10209 (45.41)	4.58 (7.37)	1391	0.8	0.455 (0.271)	15.71 (3.10)	0.015 (0.009)	205 (96)

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

Dates of tests: April 14 to May 4, 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.** *RG6090U093928* **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: 96.3 - 103.8 lb/h (43.7 - 47.1 kg/h) **High idle:** 2190 - 2210 rpm **Turbo boost:** nominal 22.5 - 26.4 psi (155 - 175 kPa) as measured 23.9 psi (165 kPa)

CHASSIS: Type front wheel assist with rubber tracks **Serial No.** *1RW8310DKLK802016* **Tread width** rear 88.0" (2235 mm) front 88.0" (2235 mm) **Wheelbase** 127.4" (3235 mm) **Length of track on ground** front 58.8" (1490 mm), rear 71.5" (1815 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range power shift **Nominal travel speeds mph (km/h)** first 1.38 (2.22) second 1.60 (2.58) third 1.85 (2.98) fourth 2.15 (3.46) fifth 2.49 (4.01) sixth 2.89 (4.65) seventh 3.31 (5.34) eighth 3.86 (6.21) ninth 4.46 (7.18) tenth 5.16 (8.31) eleventh 6.00 (9.65) twelfth 6.94 (11.17) thirteenth 8.06 (12.97)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED
MANUAL MODE - 2100 ENGINE RPM
DRAWBAR POWER AT SELECTED TRAVEL SPEED SETTINGS

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 lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
					5th Gear					
212.83 (158.70)	36735 (163.40)	2.18 (3.50)	2110	13.6	0.476 (0.290)	14.70 (2.90)	0.025 (0.015)	209 (98)	47 (8)	28.90 (97.87)
					6th Gear					
225.50 (168.16)	31941 (142.08)	2.65 (4.26)	2100	9.0	0.453 (0.276)	15.45 (3.04)	0.023 (0.014)	209 (98)	51 (10)	28.89 (97.83)
					7th Gear					
230.72 (172.05)	27552 (122.56)	3.14 (5.05)	2100	5.9	0.442 (0.269)	15.84 (3.12)	0.024 (0.014)	211 (99)	53 (12)	28.88 (97.78)
					8th Gear					
233.15 (173.86)	23534 (104.68)	3.72 (5.98)	2100	4.2	0.437 (0.266)	16.02 (3.16)	0.024 (0.015)	211 (99)	55 (13)	28.85 (97.68)
					9th Gear					
237.68 (177.23)	20451 (90.97)	4.36 (7.02)	2100	2.7	0.431 (0.262)	16.25 (3.20)	0.025 (0.015)	208 (98)	40 (4)	29.07 (98.44)
					10th Gear					
237.42 (177.04)	17515 (77.91)	5.08 (8.18)	2100	2.0	0.431 (0.262)	16.23 (3.20)	0.026 (0.016)	208 (98)	40 (4)	29.07 (98.44)
					11th Gear					
234.95 (175.20)	14844 (66.03)	5.94 (9.55)	2100	1.5	0.436 (0.265)	16.07 (3.17)	0.026 (0.016)	209 (98)	40 (4)	29.05 (98.37)
					12th Gear					
229.82 (171.37)	12509 (55.64)	6.89 (11.09)	2100	1.1	0.444 (0.270)	15.76 (3.11)	0.026 (0.016)	209 (98)	41 (5)	29.04 (98.34)
					13th Gear					
221.51 (165.18)	10357 (46.07)	8.02 (12.91)	2100	0.9	0.460 (0.280)	15.20 (3.00)	0.027 (0.017)	210 (99)	42 (6)	29.03 (98.29)

fourteenth 9.25 (14.89) fifteenth 10.74 (17.29)
 sixteenth 12.24 (19.70) seventeenth 14.21 (22.87)
 eighteenth 16.47 (26.50) nineteenth 19.11 (30.76)
 twentieth 22.12 (35.60) twenty-first 25.68 (41.33)
 twenty-second 26.10 (42.00) twenty-third 26.10
 (42.00) (electronically limited) reverse 1.66 (2.67),
 2.23 (3.59), 3.00 (4.82), 4.00 (6.43), 4.62 (7.44),
 6.21 (10.00), 8.35 (13.44), 11.14 (17.92), 14.73
 (23.71), 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** 43115 lb (19556 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: The manufacturer declares that the average time between active regenerations is 40 hours. A 3% power decrease was observed during the active regeneration.

NOTE 2: The John Deere 8RX 310 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. **2236**, Nebraska Summary 1188, 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	67.2	67.1
Transport speed-no load- 21st gear		71.2
Bystander in 21st gear		86.4

Horizontal distance of drawbar hitch point behind rear wheel axis - 56.8"(1442 mm)

TRACKS AND WEIGHT

Rear tracks - no & size
Front tracks - no & size
Height of drawbar
Static weight with operator- Rear
 - Front
 - Total

Tested Without Ballast

2 x 18.0 in (457 mm)
 2 x 18.0 in (457 mm)
 22.5 in (570 mm)
 24605 lb (11161 kg)
 18685 lb (8475 kg)
 43290 lb (19636 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 Consumption (kW.h/l)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp.°F(°C) cool- ing dry bulb	Air dry bulb	inch Hg (kPa)
2.9 mph (4.6 km/h)										
223.26 (166.48)	31901 (141.90)	2.63 (4.22)	1557	8.8	0.423 (0.257)	16.54 (3.26)	0.019 (0.012)	209 (98)	53 (11)	28.88 (97.80)
3.4 mph (5.4 km/h)										
230.67 (172.01)	27214 (121.05)	3.18 (5.12)	1581	5.9	0.410 (0.249)	17.08 (3.36)	0.019 (0.012)	209 (98)	54 (12)	28.86 (97.73)
3.9 mph (6.2 km/h)										
233.77 (174.32)	23610 (105.02)	3.71 (5.97)	1566	4.3	0.405 (0.247)	17.26 (3.40)	0.019 (0.011)	209 (98)	56 (13)	28.83 (97.63)
4.5 mph (7.2 km/h)										
237.40 (177.03)	20347 (90.51)	4.38 (7.04)	1566	2.7	0.403 (0.245)	17.35 (3.42)	0.021 (0.013)	208 (98)	40 (4)	29.07 (98.44)
5.2 mph (8.4 km/h)										
237.54 (177.13)	17337 (77.12)	5.14 (8.27)	1827	2.0	0.413 (0.251)	16.96 (3.34)	0.023 (0.014)	208 (98)	40 (4)	29.05 (98.37)
6.0 mph (9.6 km/h)										
234.79 (175.08)	14921 (66.37)	5.90 (9.50)	1805	1.5	0.418 (0.254)	16.74 (3.30)	0.025 (0.015)	209 (98)	41 (5)	29.05 (98.36)
7.0 mph (11.2 km/h)										
229.50 (171.14)	12446 (55.36)	6.92 (11.14)	1814	1.1	0.422 (0.257)	16.59 (3.27)	0.023 (0.014)	209 (98)	42 (6)	29.03 (98.31)
8.1 mph (13.0 km/h)										
221.61 (165.25)	10333 (45.96)	8.04 (12.94)	1833	0.9	0.437 (0.266)	16.01 (3.15)	0.024 (0.015)	208 (98)	42 (6)	29.02 (98.27)

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)	Consumption 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					
212.30 (158.31)	36633 (162.95)	2.18 (3.50)	2111	13.6	0.477 (0.290)	14.66 (2.89)	0.025 (0.015)	209 (98)	47 (8)	28.90 (97.87)
					6th Gear					
227.76 (169.84)	33277 (148.02)	2.57 (4.14)	2063	10.2	0.458 (0.279)	15.28 (3.01)	0.023 (0.014)	210 (99)	53 (12)	28.89 (97.83)
					7th Gear					
243.67 (181.70)	31546 (140.32)	2.90 (4.67)	1993	8.7	0.444 (0.270)	15.77 (3.11)	0.023 (0.014)	211 (99)	53 (12)	28.87 (97.77)
					8th Gear					
254.95 (190.12)	28909 (128.59)	3.31 (5.33)	1922	6.8	0.431 (0.262)	16.25 (3.20)	0.021 (0.013)	211 (99)	56 (13)	28.84 (97.66)
					9th Gear					
263.45 (196.45)	26871 (119.53)	3.68 (5.92)	1825	5.7	0.414 (0.252)	16.91 (3.33)	0.020 (0.012)	210 (99)	57 (14)	28.82 (97.60)
					10th Gear					
265.63 (198.08)	24874 (110.64)	4.01 (6.45)	1700	4.8	0.410 (0.250)	17.05 (3.36)	0.020 (0.012)	211 (99)	58 (14)	28.81 (97.56)
					11th Gear					
266.16 (198.48)	21174 (94.18)	4.72 (7.59)	1700	3.4	0.409 (0.249)	17.11 (3.37)	0.020 (0.012)	211 (99)	58 (14)	28.81 (97.54)
					12th Gear					
269.45 (200.93)	18309 (81.44)	5.52 (8.88)	1700	2.2	0.404 (0.246)	17.34 (3.41)	0.022 (0.013)	209 (98)	42 (6)	29.03 (98.31)
					13th Gear					
267.28 (199.31)	15540 (69.12)	6.45 (10.38)	1700	1.6	0.408 (0.248)	17.15 (3.38)	0.022 (0.013)	209 (98)	42 (6)	29.02 (98.27)
					14th Gear					
262.52 (195.76)	13249 (58.93)	7.43 (11.96)	1699	1.2	0.415 (0.252)	16.86 (3.32)	0.022 (0.013)	209 (98)	42 (6)	29.02 (98.27)
					15th Gear					
254.87 (190.05)	11050 (49.15)	8.65 (13.92)	1699	0.9	0.428 (0.260)	16.35 (3.22)	0.023 (0.014)	210 (99)	43 (6)	29.01 (98.24)

HYDRAULIC PERFORMANCE

CATEGORY: IVN
Quick Attach: Yes
OECD Static test

	<u>Lift cylinders</u>	
Maximum force exerted through whole range:	20235 lbs (90.0 kN)	2x115 mm
	15248 lbs (67.8 kN)	2x100 mm
	<u>85 cc pump</u> <u>85 cc and 35cc pumps combined</u>	
i) Sustained pressure at compensator cutoff:	2926 psi (202 bar)	2941 psi (203 bar)
	<u>three outlet sets combined</u>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	60.8 GPM (230.2 l/min)	86.0 GPM (325.4 l/min)
iii) Pump delivery rate at maximum hydraulic power:	60.4 GPM (228.7 l/min)	80.5 GPM (304.8 l/min)
Delivery pressure:	2511 psi (173 bar)	2239 psi (154 bar)
Power:	88.5 HP (66.0 kW)	105.2 HP (78.5 kW)
	<u>single outlet set</u>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	<u>1/2" couplers</u> 36.9 GPM (139.9 l/min)	<u>3/4" couplers</u> 43.2 GPM (163.3 l/min)
iii) Pump delivery rate at maximum hydraulic power:	34.8 GPM (131.7 l/min)	41.9 GPM (158.5 l/min)
Delivery pressure:	2337 psi (161 bar)	2309 psi (159 bar)
Power:	47.4 HP (35.4 kW)	56.4 HP (42.1 kW)

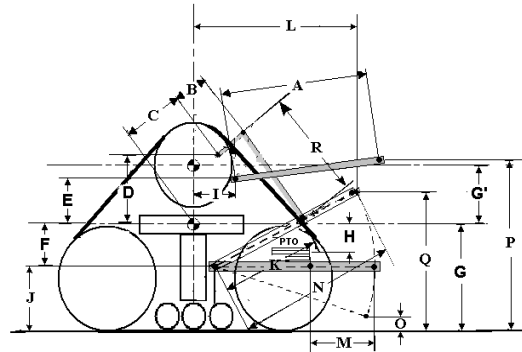
HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	27.4	695
B	20.5	520
C	33.3	847
D	28.8	732
E	21.4	544
F	4.5	113
G	29.2	741
*G'	16.4	417
*H	2.0	52
I	31.3	796
J	24.7	628
K	28.9	735
L	59.8	1520
*L'	66.5	1690
M	25.9	657
N	42.9	1090
O	9.1	230
P	51.7	1313
Q	43.3	1100
R	46.3	1175

*G' to undercarriage pivot point

*H PTO is above undercarriage pivot point

*L' to Quick Attach ends



RECOMMENDED CITATION FORMAT:

NTTL.(2021). Nebraska OECD tractor test 2236 for John Deere 8RX 310 e23 Diesel.
Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



JOHN DEERE 8RX 310 DIESEL