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2021

Test 2234: John Deere 8RT 310

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2234-SUMMARY 1186

JOHN DEERE 8RT 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.h/l)	Gal/hr (l/h)	
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1053 rpm)						
268.89 (200.51)	2101	14.43 (54.63)	0.376 (0.228)	18.63 (3.67)	0.66 (2.50)	Fuel used during active exhaust regeneration-1.20 gal (4.54 l) (see note 1, p.2)
Standard Power Take-off Speed(1000 rpm)						
294.16 (219.35)	1995	15.40 (58.30)	0.366 (0.223)	19.10 (3.76)	0.69 (2.61)	
Maximum Power (1 hour)						
308.64 (230.16)	1700	15.55 (58.85)	0.352 (0.214)	19.85 (3.91)	0.61 (2.31)	
VARYING POWER AND FUEL CONSUMPTION						
268.89 (200.51)	2101	14.43 (54.63)	0.376 (0.228)	18.63 (3.67)	0.66 (2.50)	Air temperature
234.76 (175.06)	2154	13.14 (49.73)	0.392 (0.238)	17.87 (3.52)	0.63 (2.38)	71°F (22°C)
176.42 (131.56)	2165	10.58 (40.06)	0.420 (0.255)	16.67 (3.28)	0.46 (1.76)	Relative humidity
118.43 (88.31)	2175	8.30 (31.44)	0.491 (0.298)	14.26 (2.81)	0.31 (1.16)	13%
59.49 (44.36)	2187	6.19 (23.43)	0.728 (0.443)	9.61 (1.89)	0.16 (0.59)	Barometer
1.17 (0.87)	2197	4.52 (17.09)	26.992 (16.419)	0.26 (0.05)	0.18 (0.69)	28.93" Hg (97.97 kPa)

Maximum Torque - 1013 lb.-ft. (1374 Nm) at 1550 rpm
 Maximum Torque Rise - 50.8%
 Torque rise at 1680 engine rpm - 44%
 Power increase at 1700 engine rpm - 14.8%

DRAWBAR PERFORMANCE(Unballasted)

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)	Barom. inch Hg (kPa)
Power at Rated Engine Speed—9th Gear-Manual mode								
234.53 (174.89)	20005 (88.98)	4.40 (7.08)	2100	2.0	0.432 (0.263)	16.19 (3.19)	0.025 (98)	208 (9)
75% of Pull at Rated Engine Speed—9th Gear-Manual mode								
181.83 (135.59)	14984 (66.65)	4.55 (7.32)	2159	1.4	0.461 (0.280)	15.18 (2.99)	0.026 (97)	206 (12)
50% of Pull at Rated Engine Speed—9th Gear-Manual mode								
122.75 (91.53)	10003 (44.49)	4.60 (7.40)	2171	0.9	0.532 (0.324)	13.15 (2.59)	0.025 (96)	205 (12)
75% of Pull at Reduced Engine Speed—4.6 mph(7.4 km/h)-Auto mode								
181.78 (135.55)	15055 (66.97)	4.53 (7.29)	1380	1.4	0.411 (0.250)	17.03 (3.35)	0.015 (96)	205 (13)
50% of Pull at Reduced Engine Speed—4.6 mph(7.4 km/h)-Auto mode								
122.44 (91.30)	10079 (44.83)	4.56 (7.34)	1380	0.9	0.442 (0.269)	15.83 (3.12)	0.013 (95)	204 (14)

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

Dates of tests: April 20 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 **Total time engine was operated:** 19.0 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.** *RG6090U094128* **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 23.2 - 25.4 psi (160 - 175 kPa) as measured 24.2 psi (167 kPa)

CHASSIS: Type tracklayer-rubber tracked **Serial No.** *1RW8310DHLF925011* **Track width** 72.0" (1829 mm) to 120.0" (3048 mm) **Length of track on ground** 98.7" (2508 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 1.39 (2.24) second 1.62 (2.60) third 1.87 (3.01) fourth 2.17 (3.49) fifth 2.51 (4.04) sixth 2.91 (4.69) seventh 3.35 (5.39) eighth 3.89 (6.26) ninth 4.49 (7.23) tenth 5.21 (8.39) eleventh 6.05 (9.73) twelfth 7.00 (11.27) thirteenth 8.12 (13.07) fourteenth 9.33 (15.02) fifteenth 10.83 (17.43) sixteenth 12.34 (19.87) seventeenth 14.33 (23.06) eighteenth 16.61

DRAWBAR PERFORMANCE(Unballasted)
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)
180.64 (134.70)	35352 (157.25)	1.92 (3.09)	2153	13.9	4th Gear 0.516 (0.314)	13.55 (2.67)	0.023 (0.014)	209 (98)	66 (19)	28.28 (95.77)
204.61 (152.58)	35162 (156.41)	2.19 (3.52)	2104	13.2	5th Gear 0.496 (0.302)	14.10 (2.78)	0.022 (0.013)	210 (99)	64 (18)	28.29 (95.80)
218.12 (162.65)	30435 (135.38)	2.69 (4.32)	2100	7.6	6th Gear 0.465 (0.283)	15.04 (2.96)	0.021 (0.013)	209 (98)	67 (19)	28.28 (95.75)
224.10 (167.11)	26511 (117.93)	3.17 (5.10)	2100	5.1	7th Gear 0.453 (0.276)	15.44 (3.04)	0.021 (0.013)	210 (99)	71 (22)	28.26 (95.70)
233.68 (174.25)	23382 (104.01)	3.75 (6.04)	2100	3.1	8th Gear 0.436 (0.265)	16.04 (3.16)	0.025 (0.015)	209 (98)	48 (9)	28.63 (96.94)
234.53 (174.89)	20005 (88.98)	4.40 (7.08)	2100	2.0	9th Gear 0.432 (0.263)	16.19 (3.19)	0.025 (0.015)	208 (98)	48 (9)	28.63 (96.95)
233.19 (173.89)	17112 (76.12)	5.11 (8.22)	2100	1.6	10th Gear 0.436 (0.265)	16.05 (3.16)	0.025 (0.015)	208 (98)	51 (10)	28.62 (96.92)
232.24 (173.18)	14626 (65.06)	5.95 (9.58)	2100	1.2	11th Gear 0.438 (0.267)	15.97 (3.15)	0.024 (0.015)	208 (98)	52 (11)	28.63 (96.95)
231.58 (172.69)	12577 (55.95)	6.91 (11.11)	2100	1.0	12th Gear 0.438 (0.267)	15.97 (3.15)	0.025 (0.015)	208 (98)	51 (11)	28.63 (96.95)
226.96 (169.24)	10588 (47.10)	8.04 (12.94)	2101	0.8	13th Gear 0.446 (0.271)	15.70 (3.09)	0.026 (0.016)	208 (98)	51 (11)	28.64 (96.99)

TRACTOR SOUND LEVEL WITH CAB

	dB(A)
At no load in 9th gear	68.7
Transport speed - no load - 21st gear	69.2
Bystander in 21st gear	86.1

Horizontal distance of drawbar hitch point behind rear wheel axis - 43.0"(1092 mm)

TRACKS AND WEIGHT

Track width
Height of Drawbar
Static Weight with operator

Tested Without Ballast

16.0 in (405 mm)
19.0 in (485 mm)
36090 lb (16370 kg)

(26.73) nineteenth 19.28 (31.02) twentieth 22.31 (35.91) twenty-first 25.89 (41.67) 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), 3.99 (6.42), 4.62 (7.43), 6.21 (9.99), 8.34 (13.42), 11.12 (17.90), 14.71 (23.68), 18.64 (30.00), 18.64 (30.00) (electronically limited) **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated by foot pedal **Steering** electro-hydraulic differential steering controlled by steering wheel **Power take-off** 1000 rpm at 1995 engine rpm **Unladen tractor mass** 35915 lb (16290 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 8RT 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. **2234**, Nebraska Summary 1186, October 19, 2021.

Roger M. Hoy
Director

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

DRAWBAR PERFORMANCE(Unballasted) - 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 bulb	Air dry bulb	Barom. inch Hg (kPa)
2.9mph(4.6km/h)										
214.90 (160.25)	30906 (137.48)	2.61 (4.19)	1547	8.8	0.439 (0.267)	15.95 (3.14)	0.020 (0.012)	210 (99)	70 (21)	28.27 (95.73)
3.4 mph (5.4 km/h)										
224.68 (167.54)	26524 (117.98)	3.18 (5.11)	1569	5.2	0.419 (0.255)	16.70 (3.29)	0.020 (0.012)	210 (99)	74 (23)	28.25 (95.67)
3.9mph(6.2km/h)										
233.73 (174.29)	23502 (104.54)	3.73 (6.00)	1553	2.9	0.407 (0.248)	17.18 (3.38)	0.020 (0.012)	208 (98)	48 (9)	28.63 (96.95)
4.5 mph (7.2 km/h)										
234.79 (175.08)	20115 (89.47)	4.38 (7.05)	1555	2.0	0.403 (0.245)	17.36 (3.42)	0.020 (0.012)	207 (97)	50 (10)	28.63 (96.94)
5.2 mph (8.4 km/h)										
232.65 (173.48)	17018 (75.70)	5.13 (8.26)	1567	1.6	0.402 (0.245)	17.40 (3.43)	0.019 (0.011)	207 (97)	52 (11)	28.62 (96.92)
6.1 mph (9.8 km/h)										
232.26 (173.19)	14517 (64.57)	6.00 (9.66)	1828	1.2	0.416 (0.253)	16.81 (3.31)	0.023 (0.014)	207 (97)	51 (11)	28.63 (96.95)
7.0mph(11.2km/h)										
231.31 (172.48)	12612 (56.10)	6.88 (11.07)	1801	1.0	0.416 (0.253)	16.81 (3.31)	0.023 (0.014)	207 (97)	51 (11)	28.64 (96.99)
8.1 mph (13.0 km/h)										
226.45 (168.86)	10620 (47.24)	8.00 (12.87)	1819	0.8	0.427 (0.260)	16.40 (3.23)	0.024 (0.015)	208 (98)	53 (12)	28.64 (96.99)

**DRAWBAR PERFORMANCE(Unballasted)
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	Air dry bulb	Barom. inch Hg (kPa)
181.46 (135.31)	35325 (157.13)	1.93 (3.11)	2154	13.5	4th Gear 0.514 (0.313)	13.61 (2.68)	0.023 (0.014)	209 (98)	65 (18)	28.28 (95.77)
204.73 (152.67)	35182 (156.50)	2.19 (3.52)	2102	13.1	5th Gear 0.495 (0.301)	14.13 (2.78)	0.021 (0.013)	209 (98)	64 (18)	28.29 (95.78)
220.55 (164.46)	31739 (141.18)	2.61 (4.20)	2069	9.1	6th Gear 0.469 (0.285)	14.92 (2.94)	0.021 (0.013)	210 (99)	69 (20)	28.27 (95.73)
235.79 (175.82)	30424 (135.33)	2.91 (4.68)	1989	8.1	7th Gear 0.457 (0.278)	15.31 (3.02)	0.020 (0.013)	211 (99)	72 (22)	28.25 (95.67)
246.51 (183.82)	28535 (126.93)	3.24 (5.21)	1879	6.6	8th Gear 0.440 (0.268)	15.90 (3.13)	0.020 (0.012)	211 (99)	74 (23)	28.25 (95.67)
255.10 (190.22)	26557 (118.13)	3.61 (5.80)	1782	5.5	9th Gear 0.426 (0.259)	16.41 (3.23)	0.021 (0.013)	211 (99)	75 (24)	28.25 (95.67)
264.29 (197.08)	24345 (108.29)	4.07 (6.55)	1700	3.3	10th Gear 0.411 (0.250)	17.04 (3.36)	0.021 (0.013)	208 (98)	51 (11)	28.62 (96.92)
266.64 (198.83)	20961 (93.24)	4.77 (7.68)	1700	2.3	11th Gear 0.407 (0.247)	17.20 (3.39)	0.021 (0.013)	208 (98)	52 (11)	28.63 (96.95)
267.59 (199.54)	18078 (80.41)	5.55 (8.93)	1700	1.8	12th Gear 0.404 (0.246)	17.32 (3.41)	0.021 (0.013)	209 (98)	51 (11)	28.63 (96.95)
266.73 (198.90)	15460 (68.77)	6.47 (10.41)	1701	1.4	13th Gear 0.405 (0.246)	17.28 (3.40)	0.021 (0.013)	208 (98)	52 (11)	28.64 (96.99)
263.34 (196.37)	13256 (58.96)	7.45 (11.99)	1700	1.1	14th Gear 0.410 (0.250)	17.06 (3.36)	0.021 (0.013)	208 (98)	54 (12)	28.64 (96.99)
261.07 (194.68)	11297 (50.25)	8.67 (13.94)	1700	0.8	15th Gear 0.413 (0.251)	16.95 (3.34)	0.021 (0.013)	208 (98)	54 (12)	28.64 (96.99)

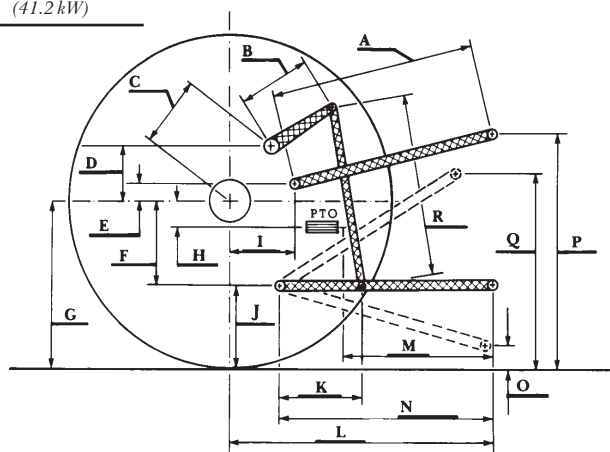
HYDRAULIC PERFORMANCE

CATEGORY: IVN		
Quick Attach: yes		
OECD Static test		
Maximum force exerted through whole range:	22144 lbs (98.5 kN) (lift cylinders - 2x115 mm) 16520 lbs (73.5 kN) (lift cylinders - 2x100 mm) <u>85 cc pump</u>	
i) Sustained pressure at compensator cutoff:	2905 psi (200 bar) three outlet sets combined	
ii) Pump delivery rate at minimum pressure and rated engine speed:	62.4 GPM (236.1 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	62.2 GPM (235.5 l/min)	
Delivery pressure:	2486 psi (171 bar)	
Power:	90.2 HP (67.3 kW)	
single outlet set		
<u>1/2" couplers</u>		<u>3/4" couplers</u>
ii) Pump delivery rate at minimum pressure and rated engine speed:	36.2 GPM (137.2 l/min)	43.0 GPM (162.9 l/min)
iii) Pump delivery rate at maximum hydraulic power:	33.7 GPM (127.6 l/min)	41.6 GPM (157.6 l/min)
Delivery pressure:	2343 psi (162 bar)	2273 psi (157 bar)
Power:	46.1 HP (34.4 kW)	55.2 HP (41.2 kW)

HITCH DIMENSIONS AS TESTED - NO LOAD

	inch	mm
A	28.3	720
B	20.5	520
C	24.8	631
D	24.2	615
E	15.5	394
F	11.5	292
G	34.5	875
H	3.1	80
I	18.5	470
J	23.0	583
K	39.8	1011
L	53.6	1361
*L'	59.5	1511
M	30.6	777
N	45.7	1161
O	9.0	230
P	50.0	1270
Q	40.6	1030
R	44.3	1124

*L' to Quick Attach ends



RECOMMENDED CITATION FORMAT:

NTTL.(2021). Nebraska OECD tractor test 2234 for John Deere 8RT 310 e23 Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



JOHN DEERE 8RT 310 DIESEL
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