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Test 2232: John Deere 8R 280

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2232-SUMMARY 1184

JOHN DEERE 8R 280 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)						
253.70 (189.18)	2101	13.28 (50.26)	0.366 (0.223)	19.11 (3.76)	0.54 (2.04)	Fuel used during active exhaust regeneration-1.12 gal (4.25 l) (see note 1, p.2)
Standard Power Take-off Speed(1000 rpm)						
276.92 (206.50)	1995	14.08 (53.31)	0.356 (0.216)	19.66 (3.87)	0.54 (2.06)	
Maximum Power (1 hour)						
285.00 (212.53)	1750	14.01 (53.02)	0.344 (0.209)	20.35 (4.01)	0.59 (2.23)	

VARYING POWER AND FUEL CONSUMPTION

253.70 (189.18)	2101	13.28 (50.26)	0.366 (0.223)	19.11 (3.76)	0.54 (2.04)	Air temperature
221.07 (164.85)	2154	12.03 (45.52)	0.381 (0.232)	18.38 (3.62)	0.51 (1.91)	71°F (21°C)
166.59 (124.23)	2164	9.71 (36.75)	0.408 (0.248)	17.16 (3.38)	0.40 (1.51)	Relative humidity
111.84 (83.40)	2177	7.61 (28.79)	0.476 (0.290)	14.70 (2.90)	0.26 (1.00)	40%
55.97 (41.74)	2189	5.64 (21.36)	0.705 (0.429)	9.92 (1.95)	0.15 (0.56)	Barometer
1.22 (0.91)	2198	4.31 (16.30)	24.655 (14.997)	0.28 (0.06)	0.20 (0.77)	28.31" Hg (95.85 kPa)

Maximum Torque - 945 lb.-ft. (1282 Nm) at 1550 rpm
 Maximum Torque Rise - 49.0%
 Torque rise at 1680 engine rpm - 39%
 Power increase at 1750 engine rpm - 12.3%

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)	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)
Power at Rated Engine Speed—9th Gear-Manual mode										
225.62 (168.24)	18280 (81.31)	4.63 (7.45)	2100	3.7	0.411 (0.250)	17.02 (3.35)	0.024 (0.015)	208 (98)	41 (5)	29.04 (98.34)
75% of Pull at Rated Engine Speed—9th Gear-Manual mode										
175.52 (130.88)	13725 (61.05)	4.80 (7.72)	2159	2.8	0.442 (0.269)	15.84 (3.12)	0.026 (0.016)	208 (98)	47 (8)	29.01 (98.24)
50% of Pull at Rated Engine Speed—9th Gear-Manual mode										
118.76 (88.56)	9151 (40.71)	4.87 (7.84)	2171	2.0	0.505 (0.307)	13.87 (2.73)	0.021 (0.013)	207 (97)	47 (8)	29.01 (98.24)
75% of Pull at Reduced Engine Speed—5.0 mph (8.0 km/h) Auto mode										
175.16 (130.61)	13782 (61.31)	4.77 (7.68)	1378	2.9	0.392 (0.238)	17.87 (3.52)	0.013 (0.008)	207 (97)	47 (8)	29.01 (98.24)
50% of Pull at Reduced Engine Speed—5.1 mph (8.2 km/h) Auto mode										
118.36 (88.26)	9006 (40.06)	4.93 (7.93)	1412	2.0	0.416 (0.253)	16.82 (3.31)	0.014 (0.008)	205 (96)	48 (9)	29.00 (98.21)

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

Dates of tests: April 8 to May 3, 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:** 20.0 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.** *RG6090U094256* **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: 87.1 - 94.1 lb/h (39.5 - 42.7 kg/h) **High idle:** 2190 - 2210 rpm **Turbo boost:** nominal 19.6 - 22.5 psi (135 - 155 kPa) as measured 21.3 psi (147 kPa)

CHASSIS: Type front wheel assist with duals **Serial No.** *1RW8280DVLB180226* **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)
					6th Gear					
195.64 (145.89)	26964 (119.94)	2.73 (4.39)	2132	14.1	0.465 (0.283)	15.06 (2.97)	0.026 (0.016)	208 (98)	41 (5)	28.99 (98.15)
					7th Gear					
216.05 (161.11)	24536 (109.14)	3.30 (5.31)	2100	7.8	0.430 (0.262)	16.27 (3.20)	0.022 (0.013)	207 (97)	43 (6)	28.98 (98.14)
					8th Gear					
222.04 (165.57)	21153 (94.09)	3.94 (6.34)	2100	5.3	0.418 (0.254)	16.73 (3.30)	0.022 (0.013)	208 (98)	46 (8)	28.96 (98.05)
					9th Gear					
225.62 (168.24)	18280 (81.31)	4.63 (7.45)	2100	3.7	0.411 (0.250)	17.02 (3.35)	0.024 (0.015)	208 (98)	41 (5)	29.04 (98.34)
					10th Gear					
223.56 (166.71)	15574 (69.27)	5.39 (8.67)	2100	3.3	0.414 (0.252)	16.90 (3.33)	0.024 (0.015)	208 (98)	44 (7)	29.03 (98.29)
					11th Gear					
222.68 (166.05)	13298 (59.15)	6.28 (10.11)	2100	2.8	0.416 (0.253)	16.81 (3.31)	0.024 (0.015)	208 (98)	44 (7)	29.03 (98.31)
					12th Gear					
220.80 (164.65)	11351 (50.49)	7.30 (11.74)	2100	2.4	0.418 (0.255)	16.73 (3.29)	0.026 (0.016)	209 (98)	46 (8)	29.02 (98.27)
					13th Gear					
218.95 (163.27)	9663 (42.98)	8.50 (13.67)	2101	2.0	0.423 (0.257)	16.56 (3.26)	0.026 (0.016)	209 (98)	47 (8)	29.02 (98.27)

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** 27455 lb (12453 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: The manufacturer declares that the average time between active regenerations is 40 hours. A 2% power decrease was observed during the active regeneration.

NOTE 2: The John Deere 8R 280 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. 2232, Nebraska Summary 1184, 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	69.0	69.0
Transport speed - no load - 20th gear		69.4
Bystander in 20th gear		85.4

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)
20.5 in (520 mm)
16110 lb (7307 kg)
11520 lb (5226 kg)
27630 lb (12533 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)
3.6 mph (5.8 km/h)										
215.57 (160.75)	24661 (109.70)	3.28 (5.28)	1556	8.0	0.401 (0.244)	17.47 (3.44)	0.017 (0.011)	208 (98)	46 (8)	28.96 (98.05)
4.2 mph (6.8 km/h)										
222.07 (165.59)	21062 (93.69)	3.95 (6.36)	1573	5.2	0.392 (0.238)	17.86 (3.52)	0.017 (0.010)	208 (98)	48 (9)	28.95 (98.04)
4.8 mph (7.8 km/h)										
225.18 (167.92)	18328 (81.52)	4.61 (7.42)	1555	3.7	0.385 (0.234)	18.19 (3.58)	0.018 (0.011)	207 (97)	42 (6)	29.04 (98.34)
5.6 mph (9.0 km/hr)										
223.16 (166.41)	15668 (69.69)	5.34 (8.59)	1550	3.2	0.382 (0.232)	18.33 (3.61)	0.017 (0.010)	209 (98)	44 (7)	29.03 (98.31)
6.6 mph (10.6 km/h)										
222.51 (165.92)	13193 (58.69)	6.32 (10.17)	1574	2.8	0.383 (0.233)	18.27 (3.60)	0.016 (0.010)	207 (97)	45 (7)	29.03 (98.31)
7.6 mph (12.2 km/h)										
220.30 (164.28)	11321 (50.36)	7.30 (11.75)	1576	2.4	0.388 (0.236)	18.06 (3.56)	0.018 (0.011)	208 (98)	47 (8)	29.02 (98.27)
8.8 mph (14.2 km/h)										
218.37 (162.84)	9609 (42.74)	8.52 (13.71)	1580	2.1	0.389 (0.237)	17.89 (3.54)	0.018 (0.011)	208 (98)	46 (8)	29.01 (98.24)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED
MANUAL MODE - 1750 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 Consumption (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)
6th Gear										
195.83 (146.03)	26939 (119.83)	2.73 (4.39)	2132	13.9	0.466 (0.283)	15.02 (2.96)	0.026 (0.016)	208 (98)	41 (5)	28.98 (98.14)
7th Gear										
219.35 (163.57)	25640 (114.05)	3.21 (5.17)	2070	9.1	0.428 (0.261)	16.33 (3.22)	0.021 (0.013)	208 (98)	44 (7)	28.97 (98.10)
8th Gear										
236.01 (175.99)	24199 (107.64)	3.66 (5.89)	1991	7.2	0.415 (0.253)	16.85 (3.32)	0.021 (0.013)	209 (98)	48 (9)	28.95 (98.02)
9th Gear										
245.26 (182.89)	22392 (99.60)	4.11 (6.61)	1906	6.0	0.401 (0.244)	17.45 (3.44)	0.019 (0.011)	210 (99)	49 (9)	28.94 (98.00)
10th Gear										
247.68 (184.69)	20381 (90.66)	4.56 (7.34)	1808	5.0	0.394 (0.240)	17.76 (3.50)	0.018 (0.011)	208 (98)	49 (9)	28.93 (97.97)
11th Gear										
250.29 (186.64)	18166 (80.80)	5.17 (8.32)	1753	4.3	0.388 (0.236)	18.05 (3.56)	0.019 (0.011)	209 (98)	49 (9)	28.93 (97.97)
12th Gear										
251.33 (187.41)	15694 (69.81)	6.01 (9.67)	1750	3.6	0.386 (0.235)	18.12 (3.57)	0.020 (0.012)	209 (98)	49 (9)	28.92 (97.93)
13th Gear										
251.17 (187.29)	13446 (59.81)	7.01 (11.27)	1750	3.1	0.386 (0.235)	18.11 (3.57)	0.019 (0.012)	209 (98)	50 (10)	28.91 (97.90)
14th Gear										
248.76 (185.50)	11554 (51.39)	8.08 (13.00)	1750	2.7	0.391 (0.238)	17.88 (3.52)	0.020 (0.012)	209 (98)	50 (10)	28.91 (97.90)

HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: Yes

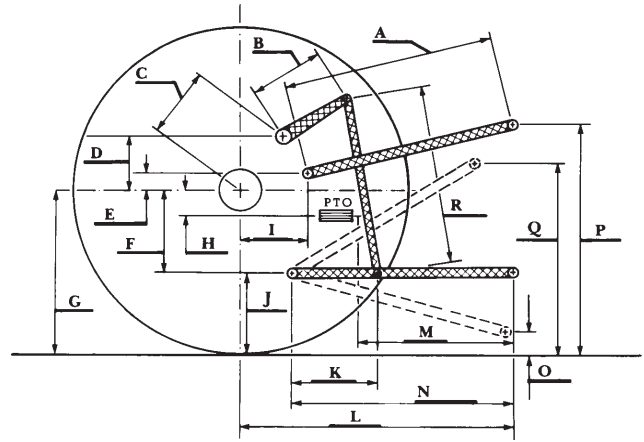
OECD Static test

	<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	
	<u>85 cc pump</u> <u>85 cc and 35cc pumps combined</u>	
i) Sustained pressure at compensator cutoff:	2870 psi (198 bar)	2915 psi (201 bar)
	three outlet sets combined	
ii) Pump delivery rate at minimum pressure and rated engine speed:	60.9 GPM(230.5 l/min)	86.0 GPM(325.4 l/min)
iii) Pump delivery rate at maximum hydraulic power:	60.9 GPM(230.5 l/min)	80.5 GPM(304.8 l/min)
Delivery pressure:	2400 psi (165 bar)	2239 psi (154 bar)
Power:	85.3 HP (63.6 kW)	105.2 HP (78.5 kW)
	single outlet set	
ii) Pump delivery rate at minimum pressure and rated engine speed:	<u>1/2" couplers</u> 36.1 GPM(136.5 l/min)	<u>3/4" couplers</u> 43.2 GPM(163.3 l/min)
iii) Pump delivery rate at maximum hydraulic power:	34.1 GPM(128.9 l/min)	41.9 GPM(158.5 l/min)
Delivery pressure:	2281 psi (157 bar)	2309 psi (159 bar)
Power:	45.3 HP (33.8 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 2232 for John Deere 8R 280 e23 Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



JOHN DEERE 8R 280 DIESEL

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