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2014

## Test 2101: John Deere 8320R

Nebraska Tractor Test Laboratory

University of Nebraska-Lincoln, tractortestlab@unl.edu

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# NEBRASKA OECD TRACTOR TEST 2101 - SUMMARY 966

## JOHN DEERE 8320R DIESEL 16 SPEED

Chassis Serial numbers 90001 and higher

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

**Dates of tests:** October 23 - 31, 2014

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

### 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)	
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>						
<b>Rated Engine Speed—(PTO speed—1048 rpm)</b>						
281.25 (209.73)	2099	14.84 (56.17)	0.371 (0.226)	18.96 (3.73)	0.32 (1.19)	Fuel used during active exhaust regeneration-0.85 gal (3.22 l) (see note 1, p.2)
<b>Standard Power Take-off Speed(1000 rpm)</b>						
307.69 (229.44)	2003	15.98 (60.49)	0.365 (0.222)	19.26 (3.79)	0.33 (1.23)	
<b>Maximum Power (1 hour)</b>						
318.08 (237.19)	1899	16.36 (61.94)	0.362 (0.220)	19.44 (3.83)	0.33 (1.24)	

### VARYING POWER AND FUEL CONSUMPTION

281.25 (209.73)	2099	14.84 (56.17)	0.371 (0.226)	18.96 (3.73)	0.32 (1.19)	Air temperature
245.50 (183.07)	2155	13.20 (49.98)	0.378 (0.230)	18.60 (3.66)	0.27 (1.01)	73°F (23°C)
184.98 (137.94)	2166	10.46 (39.59)	0.398 (0.242)	17.69 (3.48)	0.21 (0.79)	Relative humidity
123.97 (92.44)	2177	7.92 (29.98)	0.450 (0.273)	15.65 (3.08)	0.16 (0.62)	55%
62.19 (46.38)	2186	5.78 (21.89)	0.654 (0.398)	10.75 (2.12)	0.12 (0.47)	Barometer
3.76 (2.81)	2198	3.42 (12.94)	6.391 (3.888)	1.10 (0.22)	0.07 (0.28)	28.82" Hg (97.60 kPa)

Maximum Torque - 1019 lb.-ft. (1381 Nm) at 1599 rpm

Maximum Torque Rise - 44.8%

Torque rise at 1679 engine rpm - 40%

Power increase at 1899 rpm - 13.1%

### 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)
<b>Maximum Power—8th Gear</b>										
253.13 (188.76)	19848 (88.29)	4.78 (7.69)	2100	4.6	0.412 (0.251)	17.07 (3.36)	0.012 (0.007)	194 (90)	46 (8)	28.81 (97.56)
<b>75% of Pull at Maximum Power—8th Gear</b>										
198.04 (147.67)	14889 (66.23)	4.99 (8.03)	2160	3.3	0.431 (0.262)	16.31 (3.21)	0.011 (0.007)	190 (88)	54 (12)	28.85 (97.70)
<b>50% of Pull at Maximum Power—8th Gear</b>										
134.37 (100.20)	9945 (44.24)	5.07 (8.16)	2170	2.2	0.483 (0.294)	14.56 (2.87)	0.012 (0.007)	188 (86)	55 (13)	28.85 (97.70)
<b>75% of Pull at Reduced Engine Speed—11th Gear</b>										
197.78 (147.48)	14925 (66.39)	4.97 (8.00)	1391	3.2	0.389 (0.237)	18.07 (3.56)	0.011 (0.007)	207 (97)	54 (12)	28.85 (97.70)
<b>50% of Pull at Reduced Engine Speed—11th Gear</b>										
134.72 (100.46)	9932 (44.18)	5.09 (8.19)	1409	2.2	0.410 (0.249)	17.16 (3.38)	0.012 (0.007)	190 (88)	56 (13)	28.85 (97.70)

**CONSUMABLE Fluids, OIL and TIME: Fuel** No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8450 **Fuel weight** 7.036 lbs/gal (0.843 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 CJ-4** **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere Hy-Gard fluid **Total time engine was operated:** 22.0 hours

**ENGINE: Make** John Deere **Diesel Type** six cylinder vertical with two turbochargers and air to air aftercooler and D.E.F (diesel exhaust fluid) exhaust treatment **Serial No.\***RG6090U002812\* **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:** 101.3 - 109.7 lb/h (45.9 - 49.8 kg/h) **High idle:** 2190 - 2210 rpm **Turbo boost:** nominal 20.3 - 23.2 psi (140 - 160 kPa) as measured 21.2 psi (146 kPa)

**CHASSIS: Type** front wheel assist with duals **Serial No.\***1RW8320RCEP091033\* **Tread width** rear 60.0" (1524 mm) to 132.6" (3368 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) **Wheelbase** 121.3" (3080 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 1.22 (1.97) second 1.63 (2.63) third 2.18 (3.51) fourth 2.92 (4.70) fifth 3.27 (5.27) sixth 3.77 (6.07) seventh 4.39 (7.06) eighth 5.06 (8.14) ninth 5.84 (9.40) tenth 6.73 (10.83) eleventh 7.82 (12.58) twelfth 9.02 (14.51) thirteenth 10.63 (17.10) fourteenth 14.23 (22.90) fifteenth 18.95 (30.49) sixteenth 25.38 (40.85) reverse 1.14 (1.84), 3.06 (4.93), 3.87 (6.22), 7.10 (11.42) @ 1500 engine rpm

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED - 2100 RPM**  
**DRAWBAR POWER IN SELECTED GEARS**

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 (9)	Barom. inch Hg (kPa)
5th Gear										
213.05 (158.87)	27922 (124.20)	2.87 (4.61)	2152	14.0	0.467 (0.284)	15.07 (2.97)	0.011 (0.007)	191 (88)	49 (9)	28.98 (98.14)
6th Gear										
240.37 (179.24)	26727 (118.89)	3.38 (5.43)	2101	9.9	0.435 (0.265)	16.17 (3.18)	0.011 (0.006)	193 (89)	50 (10)	28.97 (98.10)
7th Gear										
249.90 (186.35)	22920 (101.95)	4.09 (6.58)	2099	5.9	0.417 (0.253)	16.89 (3.33)	0.012 (0.007)	201 (94)	51 (11)	28.83 (97.63)
8th Gear										
253.13 (188.76)	19848 (88.29)	4.78 (7.69)	2100	4.6	0.412 (0.251)	17.07 (3.36)	0.012 (0.007)	194 (90)	46 (8)	28.81 (97.56)
9th Gear										
253.78 (189.24)	17071 (75.94)	5.57 (8.96)	2100	3.9	0.411 (0.250)	17.10 (3.37)	0.011 (0.007)	196 (91)	43 (6)	28.79 (97.49)
10th Gear										
255.23 (190.32)	14823 (65.93)	6.46 (10.39)	2099	3.1	0.409 (0.249)	17.21 (3.39)	0.011 (0.007)	197 (91)	47 (8)	28.81 (97.56)
11th Gear										
250.85 (187.06)	12476 (55.49)	7.54 (12.13)	2100	2.7	0.415 (0.253)	16.94 (3.34)	0.012 (0.007)	197 (91)	47 (9)	28.82 (97.60)
12th Gear										
251.12 (187.26)	10794 (48.01)	8.73 (14.04)	2100	2.3	0.415 (0.252)	16.95 (3.34)	0.011 (0.007)	204 (96)	49 (10)	28.82 (97.60)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 8th gear	67.9	67.9
Transport speed-no load- 16th gear		70.6
Bystander in 16th gear		84.7

**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;\*\*\*;12(85)  
 Two 420/85R34;\*\*\*;26(180)  
 21.0 in (535 mm)  
 15940 lb (7230 kg)  
 11475 lb (5205 kg)  
 27415 lb(12435 kg)

**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 2004 engine rpm **Unladen tractor mass** 27240 lb (12356 kg)

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**NOTE 1:** The manufacturer declares that the average time between active regenerations is 50 hours, while operated in Auto Filter Cleaning Mode, at rated speed, full load, under steady state conditions.

**NOTE 2:** The performance data on this report applies to tractors with chassis serial numbers that end with 90001 and higher.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor did not meet the manufacturer's remote hydraulic flow claim of 85 GPM (321l/min) with the dual pumps combined. For the maximum power tests the fuel temperature at the injection pump inlet was maintained at 100°F (38°C). 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. **2101**, Nebraska Summary 966, December 19, 2014.

Roger M. Hoy  
 Director

M.F. Kocher  
 J.D. Luck  
 P.J. Jasa  
 Board of Tractor Test Engineers

**DRAWBAR PERFORMANCE**  
**UNBALLASTED-FRONT DRIVE ENGAGED - 1900 RPM**  
**MAXIMUM POWER IN SELECTED GEARS**

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										
213.21 (158.99)	27926 (124.22)	2.87 (4.61)	2152	13.9	0.466 (0.283)	15.10 (2.97)	0.011 (0.007)	191 (88)	48 (9)	28.98 (98.14)
6th Gear										
240.34 (179.22)	26721 (118.86)	3.38 (5.43)	2100	9.8	0.436 (0.265)	16.15 (3.18)	0.012 (0.007)	192 (89)	51 (11)	28.97 (98.10)
7th Gear										
264.78 (197.44)	26077 (116.00)	3.81 (6.13)	2017	8.7	0.419 (0.255)	16.77 (3.30)	0.011 (0.007)	197 (92)	52 (11)	28.97 (98.10)
8th Gear										
280.11 (208.87)	24187 (107.59)	4.35 (6.99)	1956	7.0	0.407 (0.247)	17.30 (3.41)	0.011 (0.006)	202 (94)	53 (12)	28.97 (98.10)
9th Gear										
286.42 (213.58)	21660 (96.35)	4.96 (7.98)	1900	5.3	0.401 (0.244)	17.57 (3.46)	0.010 (0.006)	205 (96)	44 (6)	28.79 (97.49)
10th Gear										
290.12 (216.34)	18822 (83.72)	5.78 (9.30)	1900	4.3	0.395 (0.240)	17.83 (3.51)	0.010 (0.006)	208 (98)	46 (8)	28.81 (97.56)
11th Gear										
288.87 (215.41)	16001 (71.17)	6.77 (10.90)	1900	3.4	0.396 (0.241)	17.75 (3.50)	0.010 (0.006)	203 (95)	48 (9)	28.82 (97.60)
12th Gear										
288.76 (215.33)	13799 (61.38)	7.85 (12.63)	1901	3.0	0.396 (0.241)	17.76 (3.50)	0.010 (0.006)	214 (101)	49 (9)	28.83 (97.63)
13th Gear										
287.60 (214.46)	11609 (51.64)	9.29 (14.95)	1900	2.5	0.398 (0.242)	17.68 (3.48)	0.011 (0.007)	214 (101)	50 (10)	28.83 (97.63)

## HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: Yes

OECD Static test

### Lift cylinders

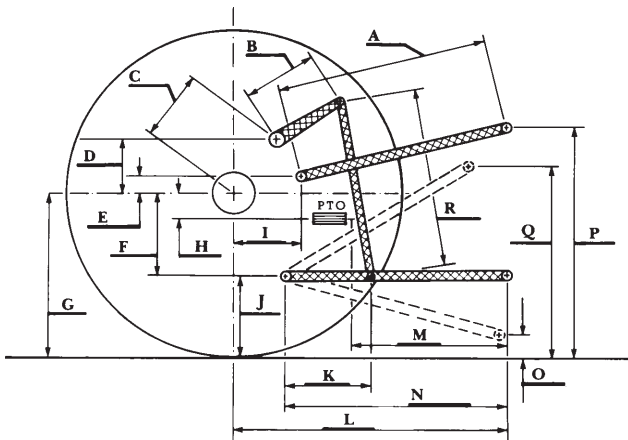
Maximum force exerted through whole range:      20254 lbs (90.1 kN) 2x115 mm  
    15229 lbs (67.7 kN) 2x100 mm

	<u>85 cc pump</u>	<u>85 cc and 35cc pumps combined</u>
i) Sustained pressure at compensator cutoff:	2919 psi (201 bar)	2941 psi (203 bar)
	<b>three outlet sets combined</b>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	60.7 GPM(229.6 l/min)	84.2 GPM(318.7l/min)
iii) Pump delivery rate at maximum hydraulic power:	60.9 GPM(230.4 l/min)	80.0 GPM(302.9l/min)
Delivery pressure:	2490 psi (172 bar)	2114 psi (146 bar)
Power:	88.4 HP (65.9 kW)	98.7 HP (73.6 kW)
	<b>single outlet set</b>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	<u>1/2" couplers</u>	<u>3/4" couplers</u>
	37.7 GPM(142.7 l/min)	42.9 GPM(162.5 l/min)
iii) Pump delivery rate at maximum hydraulic power:	36.0 GPM(136.3 l/min)	41.5 GPM(157.2 l/min)
Delivery pressure:	2287 psi (158 bar)	2301 psi (159 bar)
Power:	48.0 HP (35.8 kW)	55.8 HP (41.6 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



**JOHN DEERE 8320R DIESEL**