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2014

## Test 2099: John Deere 8270R

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# NEBRASKA OECD TRACTOR TEST 2099 - SUMMARY 964

## JOHN DEERE 8270R DIESEL

### 16 SPEED

Chassis Serial numbers 90001 and higher

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption Gal/hr (l/h)	Mean Atmospheric Conditions
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>						
<b>Rated Engine Speed—(PTO speed—1048 rpm)</b>						
237.35 (176.99)	2099	12.70 (48.06)	0.376 (0.229)	18.70 (3.68)	0.30 (1.15)	Fuel used during active exhaust regeneration-0.94 gal (3.54 l) (see note 1, p.2)
<b>Standard Power Take-off Speed(1000 rpm)</b>						
260.62 (194.34)	2003	13.52 (51.18)	0.365 (0.222)	19.28 (3.80)	0.35 (1.31)	
<b>Maximum Power (1 hour)</b>						
268.62 (200.31)	1799	13.70 (51.84)	0.359 (0.218)	19.61 (3.86)	0.34 (1.28)	

#### VARYING POWER AND FUEL CONSUMPTION

237.35 (176.99)	2099	12.70 (48.06)	0.376 (0.229)	18.70 (3.68)	0.30 (1.15)	Air temperature
207.27 (154.56)	2155	11.39 (43.13)	0.387 (0.235)	18.19 (3.58)	0.26 (0.98)	75°F (24°C)
155.98 (116.32)	2165	9.13 (34.56)	0.412 (0.251)	17.08 (3.37)	0.21 (0.81)	Relative humidity
104.39 (77.84)	2176	7.29 (27.61)	0.492 (0.299)	14.31 (2.82)	0.17 (0.64)	37%
52.62 (39.24)	2184	5.47 (20.69)	0.731 (0.445)	9.63 (1.90)	0.09 (0.36)	Barometer
2.01 (1.50)	2196	3.40 (12.86)	11.913 (7.246)	0.59 (0.12)	0.08 (0.28)	28.52" Hg (96.58 kPa)

Maximum Torque - 862 lb.-ft. (1169 Nm) at 1598 rpm

Maximum Torque Rise - 45.2%

Torque rise at 1678 engine rpm - 41%

Power increase at 1799 rpm - 13.2%

#### 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>										
217.51 (162.19)	17572 (78.16)	4.64 (7.47)	2100	2.6	0.409 (0.249)	17.20 (3.39)	0.012 (0.007)	191 (88)	57 (14)	28.73 (97.29)
<b>75% of Pull at Maximum Power—8th Gear</b>										
169.73 (126.56)	13182 (58.63)	4.83 (7.77)	2160	1.6	0.433 (0.264)	16.24 (3.20)	0.010 (0.006)	188 (86)	62 (16)	28.76 (97.39)
<b>50% of Pull at Maximum Power—8th Gear</b>										
115.04 (85.78)	8818 (39.22)	4.89 (7.87)	2172	1.1	0.497 (0.302)	14.17 (2.79)	0.013 (0.008)	185 (85)	64 (18)	28.75 (97.36)
<b>75% of Pull at Reduced Engine Speed—11th Gear</b>										
168.85 (125.91)	13200 (58.72)	4.80 (7.72)	1387	1.6	0.384 (0.233)	18.34 (3.61)	0.014 (0.009)	197 (92)	63 (17)	28.75 (97.36)
<b>50% of Pull at Reduced Engine Speed—11th Gear</b>										
114.86 (85.65)	8788 (39.09)	4.90 (7.89)	1407	1.0	0.409 (0.249)	17.21 (3.39)	0.016 (0.010)	187 (86)	64 (18)	28.76 (97.39)

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

**Dates of tests:** October 16 - 27, 2014

**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)** 0.8450 **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:** 19.0 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.\***RG6090U005948\* **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:** 85.4 - 92.5 lb/h (38.7 - 42.0 kg/h) **High idle:** 2190 - 2210 rpm **Turbo boost:** nominal 16.0 - 18.9 psi (110 - 130 kPa) as measured 16.6 psi (115 kPa)

**CHASSIS: Type** front wheel assist with duals **Serial No.\***1RW8270RCEP093526\* **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 1.16 (1.87) second 1.55 (2.50) third 2.07 (3.33) fourth 2.77 (4.46) fifth 3.11 (5.00) sixth 3.58 (5.76) seventh 4.16 (6.70) eighth 4.80 (7.72) ninth 5.54 (8.92) tenth 6.39 (10.28) eleventh 7.42 (11.94) twelfth 8.56 (13.77) thirteenth 10.09 (16.23) fourteenth 13.50 (21.73) fifteenth 17.98 (28.93) sixteenth 24.08 (38.76) reverse 1.09 (1.75), 2.91 (4.68), 3.34 (5.39), 6.73 (10.84) @ 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	Barom. inch Hg (kPa)
181.70 (135.49)	24998 (111.19)	2.73 (4.39)	2152	14.0	5th Gear 0.473 (0.288)	14.87 (2.93)	0.011 (0.007)	189 (87)	47 (8)	28.82 (97.60)
207.76 (154.93)	23606 (105.00)	3.30 (5.31)	2100	7.2	6th Gear 0.430 (0.261)	16.38 (3.23)	0.011 (0.006)	189 (87)	54 (12)	28.83 (97.63)
216.27 (161.27)	20361 (90.57)	3.98 (6.41)	2100	3.6	7th Gear 0.412 (0.250)	17.09 (3.37)	0.011 (0.007)	195 (90)	61 (16)	28.76 (97.39)
217.51 (162.19)	17572 (78.16)	4.64 (7.47)	2100	2.6	8th Gear 0.409 (0.249)	17.20 (3.39)	0.012 (0.007)	191 (88)	57 (14)	28.73 (97.29)
218.95 (163.27)	15221 (67.70)	5.40 (8.68)	2099	2.0	9th Gear 0.407 (0.247)	17.30 (3.41)	0.012 (0.007)	194 (90)	57 (14)	28.74 (97.33)
219.04 (163.33)	13146 (58.47)	6.25 (10.06)	2100	1.7	10th Gear 0.407 (0.247)	17.30 (3.41)	0.012 (0.007)	194 (90)	59 (15)	28.75 (97.36)
217.29 (162.03)	11184 (49.75)	7.29 (11.72)	2100	1.3	11th Gear 0.409 (0.249)	17.19 (3.39)	0.012 (0.007)	201 (94)	60 (15)	28.75 (97.36)
215.60 (160.77)	9603 (42.71)	8.42 (13.55)	2100	0.9	12th Gear 0.412 (0.251)	17.08 (3.36)	0.012 (0.007)	200 (93)	61 (16)	28.76 (97.39)

**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** 25040 lb (11358 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. **2099**, Nebraska Summary 964, December 19, 2014.

Roger M. Hoy  
Director

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

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 8th gear	67.7	67.7
Transport speed-no load- 16th gear		69.7
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 480/80R46;\*\*\*;12(85)  
Two 420/90R30;\*\*\*;20(140)  
19.5 in (495 mm)  
14965 lb (6788 kg)  
10250 lb (4649 kg)  
25215 lb(11437 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED-FRONT DRIVE ENGAGED - 1800 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)	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										
182.04 (135.74)	25043 (111.39)	2.73 (4.39)	2152	14.0	0.472 (0.287)	14.89 (2.93)	0.010 (0.006)	189 (87)	47 (9)	28.82 (97.60)
6th Gear										
209.07 (155.90)	24258 (107.90)	3.24 (5.21)	2085	8.6	0.433 (0.263)	16.25 (3.20)	0.011 (0.007)	190 (88)	53 (12)	28.83 (97.63)
7th Gear										
229.82 (171.37)	23121 (102.85)	3.73 (6.00)	2022	6.4	0.411 (0.250)	17.11 (3.37)	0.011 (0.007)	191 (88)	57 (14)	28.84 (97.66)
8th Gear										
241.49 (180.08)	22047 (98.07)	4.11 (6.61)	1911	5.3	0.397 (0.241)	17.73 (3.49)	0.009 (0.006)	199 (93)	58 (14)	28.84 (97.66)
9th Gear										
247.44 (184.52)	20454 (90.98)	4.54 (7.31)	1800	3.9	0.389 (0.237)	18.08 (3.56)	0.012 (0.008)	212 (100)	57 (14)	28.74 (97.33)
10th Gear										
250.58 (186.85)	17742 (78.92)	5.30 (8.52)	1800	2.7	0.384 (0.234)	18.31 (3.61)	0.012 (0.007)	209 (98)	59 (15)	28.74 (97.33)
11th Gear										
250.99 (187.16)	15186 (67.55)	6.20 (9.97)	1800	2.0	0.383 (0.233)	18.40 (3.62)	0.012 (0.007)	212 (100)	59 (15)	28.75 (97.36)
12th Gear										
251.01 (187.18)	13119 (58.35)	7.18 (11.55)	1800	1.5	0.382 (0.232)	18.41 (3.63)	0.011 (0.007)	213 (100)	59 (15)	28.76 (97.39)
13th Gear										
250.98 (187.15)	11089 (49.33)	8.49 (13.66)	1800	1.1	0.383 (0.233)	18.39 (3.62)	0.011 (0.007)	213 (101)	60 (16)	28.75 (97.36)

## HYDRAULIC PERFORMANCE

CATEGORY: III/IVN

Quick Attach: Yes

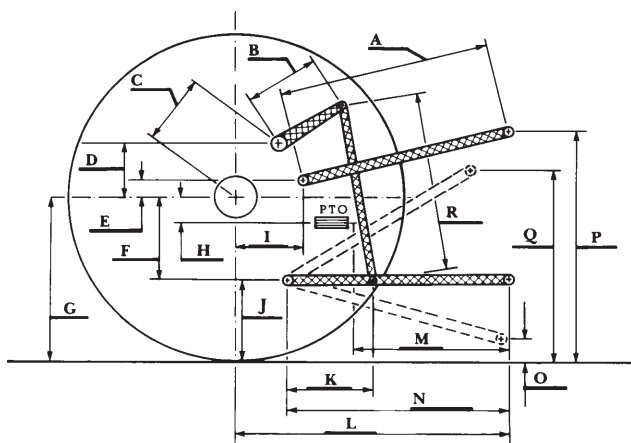
OECD Static test

	Lift cylinders		Category
Maximum force exerted through whole range:	14274 lbs (63.5 kN)	1x90 mm & 1x100 mm	III
	18869 lbs (83.9 kN)	1x100 mm & 1x115 mm	III
	20254 lbs (90.1 kN)	2x115 mm	IVN
	85 cc pump	85 cc and 35cc pumps combined	
i) Sustained pressure at compensator cutoff:	2946 psi (203 bar)	2941 psi (203 bar)	
	<b>three outlet sets combined</b>		
ii) Pump delivery rate at minimum pressure and rated engine speed:	60.6 GPM (229.2 l/min)	84.2 GPM (318.7 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	60.4 GPM (228.5 l/min)	80.0 GPM (302.9 l/min)	
Delivery pressure:	2540 psi (175 bar)	2114 psi (146 bar)	
Power:	89.5 HP (66.7 kW)	98.7 HP (73.6 kW)	
	<b>single outlet set</b>		
	1/2" couplers	3/4" couplers	
ii) Pump delivery rate at minimum pressure and rated engine speed:	37.0 GPM (140.0 l/min)	42.9 GPM (162.5 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	34.8 GPM (131.9 l/min)	41.5 GPM (157.2 l/min)	
Delivery pressure:	2405 psi (166 bar)	2301 psi (159 bar)	
Power:	48.9 HP (36.5 kW)	55.8 HP (41.6 kW)	

## HITCH DIMENSIONS AS TESTED—NO LOAD

	category III		category IVN	
	inch	mm	inch	mm
A	29.1	740	28.5	725
B	20.5	520	20.5	520
C	20.9	532	20.9	532
D	18.9	480	18.9	480
E	7.3	185	12.0	304
F	14.4	365	14.4	365
G	38.2	970	38.2	970
H	10.2	260	10.2	260
I	22.4	569	23.6	599
J	23.8	605	23.8	605
K	28.7	730	28.7	730
L	51.6	1310	52.8	1340
*L'	55.7	1415	58.7	1490
M	24.7	627	26.3	667
N	38.9	989	40.1	1019
O	9.1	230	9.1	230
P	50.1	1272	50.1	1272
Q	42.9	1090	44.7	1135
R	45.5	1155	45.7	1160

\*L' to Quick Attach ends



JOHN DEERE 8270R DIESEL

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln