

# NEBRASKA OECD TRACTOR TEST 2043—SUMMARY 834

## JOHN DEERE 9510RT DIESEL

### 18 SPEED

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
SEE NOTE 1 - PAGE 2					
<b>Rated Engine Speed—(PTO speed—1108 rpm)</b>					
313.42 (233.71)	2099	20.83 (78.85)	0.469 (0.285)	15.05 (2.96)	Fuel used during active exhaust regeneration -3.30 gal (12.48 l) (see Note 2 p.2)
<b>Standard Power Take-off Speed—(PTO speed—1000 rpm)</b>					
353.42 (263.54)	1895	21.25 (80.44)	0.424 (0.258)	16.63 (3.28)	
<b>Maximum Power (1 hour)</b>					
358.38 (267.25)	1677	20.65 (78.15)	0.406 (0.247)	17.36 (3.42)	

#### VARYING POWER AND FUEL CONSUMPTION

313.42 (233.71)	2099	20.83 (78.85)	0.469 (0.285)	15.05 (2.96)	Air temperature
266.30 (198.58)	2100	18.59 (70.37)	0.492 (0.299)	14.32 (2.82)	73°F (23°C)
201.70 (150.41)	2121	16.12 (51.60)	0.564 (0.343)	12.51 (2.46)	Relative humidity
135.90 (101.34)	2142	13.12 (49.67)	0.681 (0.414)	10.36 (2.04)	19%
68.50 (51.08)	2161	10.06 (38.07)	1.035 (0.630)	6.81 (1.34)	Barometer
2.40 (1.79)	2179	7.18 (27.16)	21.079 (12.822)	0.33 (0.07)	28.95" Hg (98.04 kPa)

Maximum Torque - 1183 lb.-ft. (1604 Nm) at 1400 rpm  
 Maximum Torque Rise - 50.9%  
 Torque rise at 1677 engine rpm - 43.2%  
 Power increase at 1677 engine rpm - 14.3%

#### 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)	Hp.hr/gal (kW.h/l)	Temp. °F cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—7th Gear</b>									
391.80 (292.17)	28905 (128.57)	5.08 (8.18)	2100	1.9	0.468 (0.284)	15.08 (2.97)	189 (87)	54 (12)	28.75 (97.36)
<b>75% of Pull at Maximum Power—7th Gear</b>									
305.09 (227.50)	21697 (96.51)	5.27 (8.48)	2164	1.2	0.516 (0.314)	13.66 (2.69)	188 (87)	72 (22)	28.68 (97.12)
<b>50% of Pull at Maximum Power—7th Gear</b>									
207.17 (154.49)	14468 (64.36)	5.37 (8.64)	2188	0.5	0.602 (0.366)	11.71 (2.31)	188 (87)	74 (23)	28.65 (97.02)
<b>75% of Pull at Reduced Engine Speed—10th Gear</b>									
305.22 (227.60)	21612 (96.13)	5.30 (8.53)	1589	1.1	0.441 (0.268)	15.98 (3.15)	197 (91)	73 (23)	28.66 (97.05)
<b>50% of Pull at Reduced Engine Speed—10th Gear</b>									
207.56 (154.77)	14450 (64.28)	5.39 (8.67)	1604	0.5	0.479 (0.291)	14.72 (2.90)	189 (87)	75 (24)	28.64 (96.99)

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

**Dates of tests:** October 2- 16, 2012

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

**FUEL, OIL and TIME:** Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8467 Fuel weight 7.050 lbs/gal (0.845 kg/l) Oil SAE 15W-40 API service classification CJ-4 Transmission and hydraulic lubricant John Deere Hy-Gard fluid Total time engine was operated: 30.0 hours

**ENGINE: Make** John Deere Diesel **Type** six cylinder vertical with two turbochargers and air to air aftercooler **Serial No.** \*RG6135R003326\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.197" x 6.496" (132.0 mm x 165.0 mm) **Compression ratio** 16.0 to 1 **Displacement** 826 cu in (13548 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, separate radiators for hydraulic and transmission oil, radiator for rear axle oil **Fuel filter** two paper cartridges **Fuel cooler** radiator for returned fuel **Exhaust** regenerative particulate filter integrated within a vertical muffler **Cooling medium temperature control** 3 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** Stationary PTO operation 141.5 - 153.4 lb/h (64.2 - 69.6 kg/h), (460 engine hp) 161.8 - 175.2 lb/h (73.4 - 79.5 kg/h), (485 engine hp) 168.7 - 182.8 lb/h (76.5 - 82.9 kg/h), (510 engine hp) 177.2 - 192.0 lb/h (80.4 - 87.1 kg/h) **High idle:** 2215 - 2265 rpm (2160 - 2200 rpm with PTO engaged) **Turbo boost:** (510 engine hp) nominal 33.3 - 39.2 psi (230 - 270 kPa) as measured 36.0 psi (250 kPa)

**CHASSIS: Type** tracklayer-rubber tracked **Serial No.** \*1RW9510RTCP901378\* **Track width** 107.4" (2728 mm) **Length of track on ground** 111.0" (2819 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 2.51 (4.04) second 3.09 (4.97) third 3.41 (5.49) fourth 3.82 (6.14) fifth 4.20 (6.76) sixth 4.70 (7.56) seventh 5.20 (8.36) eighth 5.77 (9.29) ninth 6.39 (10.29) tenth 7.10 (11.43) eleventh 7.85 (12.63) twelfth 8.73 (14.05) thirteenth 9.66 (15.55) fourteenth 10.75 (17.30) fifteenth 13.29 (21.39) sixteenth 16.35 (26.31) seventeenth 20.07 (32.30) eighteenth 24.72 (39.77) reverse 2.51 (4.04), 3.41 (5.49), 3.82 (6.14), 5.20 (8.36), 5.77 (9.29), 7.85 (12.63)

## DRAWBAR PERFORMANCE

(Unballasted at 2100 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)	Consumption Hp.lhr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
1st Gear									
286.76 (213.83)	48210 (214.45)	2.23 (3.59)	2135	12.3	0.577 (0.351)	12.22 (2.41)	187 (86)	47 (8)	28.95 (98.04)
2nd Gear									
327.79 (244.43)	42704 (189.96)	2.88 (4.63)	2100	6.4	0.517 (0.315)	13.63 (2.69)	188 (87)	47 (8)	28.96 (98.07)
3rd Gear									
340.73 (254.08)	39384 (175.19)	3.25 (5.22)	2101	4.8	0.497 (0.302)	14.18 (2.79)	188 (87)	48 (9)	28.98 (98.14)
4th Gear									
359.73 (268.25)	36861 (163.96)	3.66 (5.89)	2101	3.9	0.489 (0.297)	14.42 (2.84)	189 (87)	50 (10)	29.00 (98.21)
5th Gear									
382.66 (285.35)	35498 (157.90)	4.05 (6.51)	2101	3.5	0.477 (0.290)	14.78 (2.91)	189 (87)	50 (10)	28.99 (98.17)
6th Gear									
386.68 (288.35)	31644 (140.76)	4.59 (7.38)	2100	2.4	0.475 (0.289)	14.84 (2.92)	190 (88)	56 (13)	28.75 (97.36)
7th Gear									
391.90 (292.17)	28905 (128.57)	5.08 (8.18)	2100	1.9	0.468 (0.284)	15.08 (2.97)	189 (87)	54 (12)	28.75 (97.36)
8th Gear									
391.99 (292.31)	25924 (115.32)	5.67 (9.12)	2101	1.5	0.467 (0.284)	15.09 (2.97)	189 (87)	52 (11)	28.75 (97.36)
9th Gear									
390.21 (290.98)	23203 (103.21)	6.31 (10.15)	2101	1.2	0.472 (0.287)	14.93 (2.94)	190 (88)	59 (15)	28.75 (97.36)
10th Gear									
388.58 (289.76)	20769 (92.38)	7.02 (11.29)	2101	1.0	0.469 (0.285)	15.04 (2.96)	191 (88)	60 (16)	28.74 (97.33)
11th Gear									
390.20 (290.97)	18799 (83.62)	7.78 (12.52)	2102	0.8	0.469 (0.285)	15.04 (2.96)	191 (88)	62 (17)	28.74 (97.33)
12th Gear									
389.48 (290.43)	16858 (74.99)	8.67 (13.94)	2101	0.6	0.469 (0.285)	15.04 (2.96)	192 (89)	62 (17)	28.74 (97.33)

**Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated foot pedal **Steering** electro-hydraulic differential steering controlled by steering wheel **Power take-off** 1000 rpm at 1895 engine rpm **Unladen tractor mass** 46645 lb (21158 kg)

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

**NOTE 1.** The engine on this model operates in a derated mode when the PTO is engaged. This run was done with the field cruise system engaged.

**NOTE 2.** The manufacturer declares that the average time between active regenerations is 15 hours, while operated in Auto Filter Cleaning Mode, at rated speed, full PTO load, under steady state conditions.

**NOTE 3.** The 9510RT engine has an electronic control system which provides a vehicle protection system to avoid overloading the drive train. This system provides three different engine power levels. At 2100 rpm the engine produces up to 460 hp when the transmission is in forward gears 1 through 3. At 2100 rpm the engine produces 485 hp when the transmission is in forward gear 4. The engine produces 510 hp at 2100 rpm in all other gears.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests the fuel temperature at the primary fuel filter was maintained at 104°F (40°C). The performance figures on this summary were taken from a test conducted under the OECD Code II test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2043**, Nebraska Summary 834, February 20, 2013.

Roger M. Hoy  
Director

M.R. Riley  
P.J. Jasa  
J.D. Luck  
Board of Tractor Test Engineers

### TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 6th gear	72.8
Transport speed-no load- 18th gear	75.3
Bystander in 18th gear	88.2

### TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
<b>Track width</b>	30.0 in (760 mm)	30.0 in (760 mm)
<b>Ballast - Cast iron (front)</b>	3235 lb (1467 kg)	None
- Cast iron (idlers)	2520 lb (1143 kg)	None
- Cast iron (side)	200 lb (91 kg)	None
<b>Height of Drawbar</b>	20.5 in (520 mm)	20.0 in (510 mm)
<b>Static Weight with operator</b>	52775 lb (23938 kg)	46820 lb (21237 kg)

**DRAWBAR PERFORMANCE**  
**(Unballasted at 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)	Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
289.80 (216.10)	48349 (215.07)	2.25 (3.61)	2135	11.5	0.571 (0.347)	12.34 (2.43)	188 (86)	47 (8)	28.95 (98.04)
335.50 (250.18)	46204 (205.53)	2.73 (4.39)	2039	8.9	0.515 (0.313)	13.70 (2.70)	189 (87)	48 (9)	28.97 (98.10)
355.53 (265.12)	44690 (198.79)	2.99 (4.80)	2007	8.2	0.492 (0.299)	14.32 (2.82)	190 (88)	51 (11)	29.00 (98.21)
385.47 (287.44)	43551 (193.72)	3.32 (5.34)	1979	7.5	0.480 (0.292)	14.69 (2.89)	191 (88)	52 (11)	29.00 (98.21)
415.09 (309.53)	42582 (189.41)	3.66 (5.88)	1966	6.8	0.465 (0.283)	15.16 (2.99)	192 (89)	52 (11)	29.00 (98.21)
418.82 (312.31)	41823 (186.04)	3.76 (6.04)	1800	6.6	0.460 (0.280)	15.33 (3.02)	199 (93)	53 (11)	29.01 (98.24)
431.99 (322.13)	38230 (170.06)	4.24 (6.82)	1800	4.7	0.443 (0.269)	15.92 (3.14)	200 (93)	52 (11)	29.02 (98.27)
435.52 (324.76)	34335 (152.73)	4.76 (7.65)	1799	3.4	0.439 (0.267)	16.07 (3.16)	213 (101)	74 (23)	28.59 (96.82)
434.61 (324.08)	30593 (136.08)	5.33 (8.57)	1799	2.6	0.439 (0.267)	16.07 (3.17)	215 (101)	76 (24)	28.59 (96.82)
439.88 (328.01)	27677 (123.11)	5.96 (9.59)	1800	1.9	0.433 (0.263)	16.28 (3.21)	213 (101)	72 (22)	28.60 (96.85)
443.05 (330.38)	25131 (111.79)	6.61 (10.64)	1800	1.4	0.430 (0.261)	16.40 (3.23)	212 (100)	70 (21)	28.61 (96.88)
445.22 (332.00)	22624 (100.63)	7.38 (11.88)	1799	1.1	0.426 (0.259)	16.53 (3.26)	213 (101)	72 (22)	28.60 (96.85)
435.95 (325.09)	19989 (88.91)	8.18 (13.16)	1799	0.9	0.435 (0.265)	16.21 (3.19)	214 (101)	73 (23)	28.59 (96.82)

**Lugging ability in 11th gear**

Crankshaft speed rpm	2102	2000	1900	1800	1700	1601	1399	1104
Pull-lbs (kN)	18799 (83.62)	21832 (97.11)	23751 (105.65)	25228 (112.22)	26235 (116.70)	26942 (119.84)	26819 (119.30)	25197 (112.08)
Increase in pull%	0	16	26	34	40	43	43	34
Power-Hp (kW)	390.20 (290.97)	429.75 (320.46)	443.05 (330.38)	445.14 (331.94)	436.37 (325.40)	421.16 (314.06)	366.97 (273.65)	272.68 (203.34)
Speed-mpH (km/h)	7.78 (12.52)	7.38 (11.88)	7.00 (11.27)	6.62 (10.65)	6.24 (10.04)	5.86 (9.43)	5.13 (8.26)	4.06 (6.53)
Slip %	0.8	1.1	1.3	1.5	1.7	1.8	1.7	1.4

**DRAWBAR PERFORMANCE**  
**(Ballasted at 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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
322.86 (240.75)	55876 (248.55)	2.17 (3.49)	2057	11.9	1st Gear 0.535 (0.325)	13.19 (2.60)	188 (86)	45 (7)	28.69 (97.16)
365.35 (272.45)	53471 (237.85)	2.56 (4.12)	1917	9.1	2nd Gear 0.486 (0.296)	14.49 (2.86)	191 (88)	47 (8)	28.69 (97.16)
379.39 (282.91)	52101 (231.76)	2.73 (4.39)	1831	8.3	3rd Gear 0.462 (0.281)	15.26 (3.01)	192 (89)	51 (10)	28.69 (97.16)
400.57 (298.70)	49239 (219.02)	3.05 (4.91)	1800	6.8	4th Gear 0.454 (0.276)	15.54 (3.06)	194 (90)	52 (11)	28.69 (97.16)
428.97 (319.88)	47652 (211.92)	3.38 (5.43)	1800	6.2	5th Gear 0.446 (0.271)	15.82 (3.12)	203 (95)	56 (13)	28.68 (97.12)
434.23 (323.81)	42170 (187.58)	3.86 (6.21)	1800	4.1	6th Gear 0.440 (0.267)	16.03 (3.16)	202 (94)	57 (14)	28.68 (97.12)
445.87 (332.48)	38787 (172.53)	4.31 (6.94)	1800	3.1	7th Gear 0.428 (0.260)	16.47 (3.25)	202 (94)	58 (14)	28.67 (97.09)
446.30 (332.81)	34718 (154.43)	4.82 (7.76)	1801	2.5	8th Gear 0.425 (0.258)	16.60 (3.27)	206 (96)	60 (16)	28.67 (97.09)
443.63 (330.81)	30963 (137.73)	5.37 (8.65)	1801	1.9	9th Gear 0.427 (0.260)	16.50 (3.25)	206 (97)	65 (18)	28.64 (96.99)
443.01 (330.35)	27713 (123.27)	5.99 (9.65)	1800	1.5	10th Gear 0.428 (0.260)	16.47 (3.25)	212 (100)	66 (19)	28.63 (96.95)
442.97 (330.32)	25018 (111.29)	6.64 (10.69)	1800	1.1	11th Gear 0.427 (0.260)	16.51 (3.25)	213 (101)	67 (19)	28.61 (96.88)
444.99 (331.83)	22484 (100.01)	7.43 (11.95)	1800	0.8	12th Gear 0.427 (0.260)	16.52 (3.26)	214 (101)	69 (21)	28.61 (96.88)
436.80 (325.72)	19949 (88.74)	8.21 (13.21)	1799	0.7	13th Gear 0.434 (0.264)	16.25 (3.20)	215 (101)	69 (21)	28.60 (96.85)

## HYDRAULIC PERFORMANCE

CATEGORY: IV

Quick Attach: yes

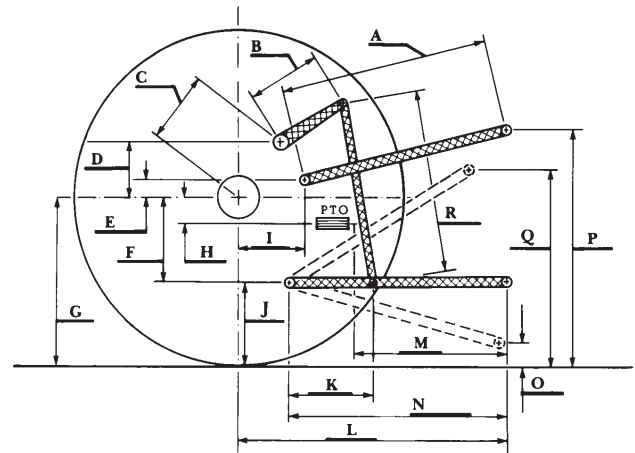
OECD Static test

	<u>lift cylinders</u>	
Maximum force exerted through whole range:	15642 lbs (69.6 kN) (1 x 90 mm and 1 x 100 mm)	21147 lbs (94.1 kN) (2 x 110 mm)
	<u>High flow pump</u>	<u>Base pump</u>
	<u>three outlet sets combined</u>	
i) Sustained pressure at compensator cutoff:	2914 psi (201 bar)	2959 psi (204 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	53.8 GPM (203.5 l/min)	32.3 GPM (122.1 l/min)
Combined flow:	86.1 GPM (325.6 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	53.8 GPM (203.8 l/min)	31.8 GPM (120.5 l/min)
Delivery pressure:	2526 psi (174 bar)	2772 psi (191 bar)
Power:	79.3 HP (59.2 kW)	51.5 HP (38.4 kW)
	<u>single outlet set</u>	
i) Sustained pressure at compensator cutoff:	2914 psi (201 bar)	2957 psi (204 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	38.6 GPM (146.1 l/min)	32.1 GPM (121.4 l/min)
iii) Pump delivery rate at maximum hydraulic power:	38.0 GPM (143.8 l/min)	32.3 GPM (122.1 l/min)
Delivery pressure:	2115 psi (146 bar)	2387 psi (165 bar)
Power:	46.9 HP (35.0 kW)	44.9 HP (33.5 kW)

## HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	30.7	780
B	19.7	500
C	31.9	810
D	30.4	772
E	13.2	335
F	13.8	350
G	37.6	955
H	0.7	19
I	23.1	586
J	23.8	605
K	30.9	785
L	57.0	1447
*L'	62.4	1584
M	32.4	822
N	45.6	1159
O	9.0	230
P	50.8	1291
Q	38.6	980
R	50.4	1280

\*L' to Quick Attach ends



**JOHN DEERE 9510RT DIESEL**