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2012

## Test 2042: John Deere 9510R

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 2042–SUMMARY 833

## JOHN DEERE 9510R 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> <b>SEE NOTE 1 - PAGE 2</b>					
<b>Rated Engine Speed—(PTO speed—1108 rpm)</b>					
320.07 (238.67)	2099	20.96 (79.34)	0.461 (0.280)	15.27 (3.01)	Fuel used during active exhaust regeneration - 2.72 gal (10.30 l) (see Note 2 p.2)
<b>Standard Power Take-off Speed—(PTO speed—1000 rpm)</b>					
360.20 (268.60)	1895	21.45 (81.19)	0.419 (0.255)	16.79 (3.31)	
<b>Maximum Power (1 hour)</b>					
368.33 (274.67)	1650	21.03 (79.63)	0.402 (0.245)	17.51 (3.45)	

#### VARYING POWER AND FUEL CONSUMPTION

320.07 (238.67)	2099	20.96 (79.34)	0.461 (0.280)	15.27 (3.01)	Air temperature
271.90 (202.76)	2101	19.02 (71.99)	0.492 (0.300)	14.30 (2.82)	72°F (22°C)
206.00 (153.61)	2122	16.06 (60.79)	0.549 (0.334)	12.83 (2.53)	Relative humidity
139.00 (103.65)	2141	12.96 (49.06)	0.656 (0.399)	10.73 (2.11)	22%
70.00 (52.20)	2165	9.64 (36.49)	0.969 (0.590)	7.26 (1.43)	Barometer
2.10 (1.57)	2182	6.75 (25.55)	22.629 (13.764)	0.31 (0.06)	28.79" Hg (97.49 kPa)

Maximum Torque - 1210 lb.-ft. (1640 Nm) at 1450 rpm

Maximum Torque Rise - 51.4%

Torque rise at 1679 engine rpm - 43%

Power increase at 1650 engine rpm - 15.1%

#### 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 (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—7th Gear</b>									
410.97 (306.46)	31792 (141.42)	4.85 (7.80)	2101	2.9	0.461 (0.280)	15.28 (3.01)	188 (86)	40 (4)	28.91 (97.90)
<b>75% of Pull at Maximum Power—7th Gear</b>									
314.28 (234.35)	23335 (103.80)	5.05 (8.13)	2166	2.1	0.509 (0.310)	13.83 (2.72)	193 (89)	77 (25)	28.39 (96.14)
<b>50% of Pull at Maximum Power—7th Gear</b>									
213.52 (159.22)	15569 (69.25)	5.14 (8.27)	2191	1.2	0.589 (0.358)	11.96 (2.36)	188 (87)	80 (27)	28.38 (96.11)
<b>75% of Pull at Reduced Engine Speed—10th Gear</b>									
314.27 (234.35)	23185 (103.13)	5.09 (8.18)	1593	2.1	0.438 (0.267)	16.06 (3.16)	204 (96)	78 (26)	28.38 (96.11)
<b>50% of Pull at Reduced Engine Speed—10th Gear</b>									
213.71 (159.36)	15510 (68.99)	5.17 (8.32)	1606	1.2	0.473 (0.288)	14.89 (2.93)	189 (87)	78 (26)	28.39 (96.14)

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

**Dates of Test:** October 23-31, 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) 0.8455 Fuel weight 7.040 lbs/gal (0.844 kg/l) Oil SAE 15W-40 API service classification CH-4 Transmission, hydraulic and final drive lubricant John Deere Hy-Gard fluid Total time engine was operated: 31.5 hours

**ENGINE:** Make John Deere Diesel Type six cylinder vertical with two turbochargers and air to air aftercooler Serial No. \*RG6135R003689\* 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, radiator for hydraulic oil, radiator for transmission, front and 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 2 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), (435 engine hp) 153.2 - 166.0 lb/h (69.5 - 75.3 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: 2150 - 2250 rpm (2160 - 2200 rpm with PTO engaged) Turbo boost: (510 engine hp) nominal 32.0 - 37.7 psi (220 - 260 kPa) as measured 35.0 psi (240 kPa)

**CHASSIS:** Type four wheel drive with triples Serial No. \*1RW9510RLCP002871\* Tread width rear 59.1" (1500 mm) to 163.8" (4160 mm), front 59.1" (1500 mm) to 163.8" (4160 mm) Wheelbase 137.8" (3500 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 2.37 (3.81) second 2.91 (4.69) third 3.23 (5.19) fourth 3.60 (5.79) fifth 3.96 (6.38) sixth 4.42 (7.12) seventh 4.90 (7.89) eighth 5.47 (8.81) ninth 6.03 (9.71) tenth 6.74 (10.84) eleventh 7.46 (12.00) twelfth 8.25 (13.27) thirteenth 9.18 (14.77) fourteenth 10.15 (16.33) fifteenth 12.54 (20.18) sixteenth 15.43 (24.83) seventeenth 19.08 (30.70) eighteenth 23.48 (37.78) reverse 2.37 (3.81), 3.23 (5.19), 3.60 (5.79), 4.90 (7.89), 5.47 (8.81), 7.46 (12.00)

## 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)	Temp.°F cool- ing med	Temp.°F Air dry bulb	Barom. inch Hg (kPa)	
253.27 (188.86)	44915 (199.79)	2.12 (3.40)	2157	14.7	1st Gear 0.603 (0.367)	11.68 (2.30)	186 (85)	42 (6)	28.84 (97.66)
317.67 (236.89)	43375 (192.94)	2.75 (4.42)	2104	7.8	2nd Gear 0.518 (0.315)	13.58 (2.67)	187 (86)	43 (6)	28.84 (97.66)
349.67 (260.75)	42931 (190.97)	3.06 (4.91)	2100	7.0	3rd Gear 0.495 (0.301)	14.23 (2.80)	188 (86)	43 (6)	28.85 (97.70)
378.12 (281.96)	40782 (181.41)	3.48 (5.60)	2101	5.3	4th Gear 0.481 (0.293)	14.63 (2.88)	188 (86)	42 (6)	28.87 (97.77)
404.05 (301.30)	39297 (174.80)	3.86 (6.20)	2100	4.6	5th Gear 0.469 (0.285)	15.01 (2.96)	188 (87)	41 (5)	28.89 (97.83)
407.26 (303.69)	35025 (155.80)	4.36 (7.02)	2100	3.5	6th Gear 0.465 (0.283)	15.14 (2.98)	188 (86)	40 (4)	28.91 (97.90)
410.97 (306.46)	31792 (141.42)	4.85 (7.80)	2101	2.9	7th Gear 0.461 (0.280)	15.28 (3.01)	188 (86)	40 (4)	28.91 (97.90)
409.49 (305.36)	28340 (126.06)	5.42 (8.72)	2102	2.5	8th Gear 0.461 (0.280)	15.28 (3.01)	189 (87)	56 (13)	28.50 (96.51)
408.05 (304.28)	25387 (112.92)	6.03 (9.70)	2101	2.1	9th Gear 0.463 (0.281)	15.22 (3.00)	190 (88)	56 (13)	28.49 (96.48)
408.91 (304.92)	22809 (101.46)	6.73 (10.82)	2100	1.8	10th Gear 0.461 (0.281)	15.26 (3.01)	191 (88)	56 (13)	28.48 (96.44)
406.67 (303.25)	20516 (91.26)	7.44 (11.97)	2101	1.6	11th Gear 0.461 (0.280)	15.28 (3.01)	198 (92)	61 (16)	28.46 (96.38)
408.85 (304.88)	18504 (82.31)	8.29 (13.33)	2101	1.5	12th Gear 0.457 (0.278)	15.39 (3.03)	204 (95)	66 (19)	28.42 (96.24)

**Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated foot pedal **Steering** hydrostatic and articulated **Power take-off** 1000 rpm at 1895 engine rpm **Unladen tractor mass** 44255 lb (20074 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 9510R engine has an electronic control system which provides a vehicle protection system to avoid overloading the drive train. This system provides four different engine power levels. At 2100 rpm the engine produces up to 435 hp when the transmission is in forward gears 1 and 2. The engine produces 460 hp in gear 3 and 485 hp in 4. The engine produces 510 hp at 2100 rpm for 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 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2042**, Nebraska Summary 833, 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	74.1
Transport speed - no load - 18th gear	75.1
Bystander in 18th gear	88.1

### TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi (kPa)	Six 480/80R46;***;12(85)	Six 480/80R46;***;12(85)
<b>Ballast</b> - Cast Iron (back end)	1000 lb (454 kg)	None
- Cast Iron (on axles)	4500 lb (2041 kg)	None
<b>Front Tires</b> - No., size, ply & psi (kPa)	Six 480/80R46;***;17(115)	Six 480/80R46;***;16(110)
<b>Ballast</b> - Cast Iron (front end)	655 lb (297 kg)	None
- Cast Iron (on axles)	2700 lb (1225 kg)	None
<b>Height of Drawbar</b>	21.5 in (545 mm)	22.5 in (570 mm)
<b>Static Weight with operator</b> - Rear	23090 lb (10474 kg)	17705 lb (8031 kg)
- Front	30195 lb (13696 kg)	26725 lb (12122 kg)
- Total	53285 lb (24170 kg)	44430 lb (20153 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)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
253.76 (189.23)	44967 (200.02)	2.12 (3.40)	2157	14.6	1st Gear 0.608 (0.370)	11.57 (2.28)	186 (85)	42 (6)	28.83 (97.63)
318.83 (237.37)	43600 (193.84)	2.74 (4.41)	2100	7.8	2nd Gear 0.518 (0.315)	13.59 (2.68)	187 (86)	43 (6)	28.84 (97.66)
353.95 (263.94)	43648 (194.16)	3.05 (4.90)	2090	7.0	3rd Gear 0.491 (0.298)	14.35 (2.83)	188 (86)	42 (6)	28.87 (97.77)
388.16 (289.45)	43385 (192.98)	3.36 (5.40)	2053	6.5	4th Gear 0.476 (0.290)	14.79 (2.91)	188 (87)	42 (5)	28.89 (97.83)
424.70 (316.70)	43376 (192.94)	3.68 (5.91)	2035	6.3	5th Gear 0.461 (0.281)	15.26 (3.01)	189 (87)	41 (5)	28.89 (97.83)
443.47 (330.69)	42493 (189.02)	3.91 (6.29)	1924	5.5	6th Gear 0.445 (0.271)	15.83 (3.12)	189 (87)	40 (4)	28.92 (97.93)
454.84 (339.17)	40055 (178.17)	4.26 (6.85)	1874	4.6	7th Gear 0.435 (0.265)	16.17 (3.19)	191 (88)	41 (5)	28.92 (97.93)
460.14 (343.12)	37751 (167.92)	4.58 (7.36)	1800	4.0	8th Gear 0.429 (0.261)	16.42 (3.24)	193 (89)	40 (4)	28.93 (97.97)
461.45 (344.10)	33921 (150.89)	5.10 (8.21)	1800	3.2	9th Gear 0.428 (0.260)	16.45 (3.24)	191 (88)	40 (4)	28.94 (98.00)
462.86 (345.15)	30442 (135.41)	5.70 (9.17)	1800	2.7	10th Gear 0.425 (0.258)	16.58 (3.27)	193 (89)	40 (4)	28.94 (98.00)
458.61 (341.99)	27158 (120.80)	6.33 (10.19)	1798	2.4	11th Gear 0.426 (0.259)	16.51 (3.25)	214 (101)	60 (16)	28.46 (96.38)
462.53 (344.91)	24592 (109.39)	7.06 (11.35)	1800	2.1	12th Gear 0.423 (0.257)	16.65 (3.28)	213 (101)	65 (18)	28.45 (96.34)
456.22 (340.28)	21833 (97.12)	7.84 (12.61)	1799	1.8	13th Gear 0.429 (0.261)	16.42 (3.23)	217 (103)	65 (18)	28.44 (96.31)
462.31 (344.74)	19846 (88.28)	8.74 (14.06)	1799	1.6	14th Gear 0.426 (0.259)	16.54 (3.26)	217 (103)	66 (19)	28.43 (96.28)

## **Lugging ability in 11th gear**

Crankshaft speed rpm	2101	1999	1900	1801	1700	1601	1400	1101
Pull-lbs (kN)	20504 (91.20)	23781 (105.78)	25655 (114.12)	27214 (121.05)	28457 (126.58)	29268 (130.19)	29140 (129.62)	26747 (118.98)
Increase in pull %	0	16	25	32	39	43	42	30
Power-Hp (kW)	406.73 (303.30)	447.86 (333.97)	457.66 (341.28)	459.43 (342.60)	452.03 (337.08)	437.98 (326.60)	380.99 (284.10)	276.03 (205.84)
Speed-mph (km/h)	7.44 (11.97)	7.06 (11.36)	6.69 (10.77)	6.33 (10.19)	5.96 (9.59)	5.61 (9.03)	4.90 (7.89)	3.87 (6.23)
Slip %	1.6	1.9	2.1	2.3	2.5	2.6	2.6	2.3

**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)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
302.89 (225.86)	55484 (246.80)	2.05 (3.30)	2078	13.9	1st Gear 0.552 (0.336)	12.76 (2.51)	188 (87)	50 (10)	28.91 (97.90)
361.20 (269.35)	53648 (238.64)	2.53 (4.06)	1935	7.4	2nd Gear 0.480 (0.292)	14.66 (2.89)	191 (88)	51 (11)	28.91 (97.90)
395.12 (294.64)	53337 (237.25)	2.78 (4.47)	1920	7.1	3rd Gear 0.465 (0.283)	15.14 (2.98)	192 (89)	53 (11)	28.90 (97.87)
420.37 (313.47)	52187 (232.14)	3.02 (4.86)	1849	6.2	4th Gear 0.456 (0.277)	15.45 (3.04)	193 (89)	54 (12)	28.90 (97.87)
445.98 (332.57)	51513 (229.14)	3.25 (5.23)	1800	5.9	5th Gear 0.444 (0.270)	15.86 (3.12)	200 (93)	54 (12)	28.90 (97.87)
451.18 (336.44)	45642 (203.02)	3.71 (5.97)	1800	4.0	6th Gear 0.439 (0.267)	16.05 (3.16)	201 (94)	55 (13)	28.90 (97.87)
460.74 (343.57)	41882 (186.30)	4.13 (6.64)	1800	3.3	7th Gear 0.430 (0.261)	16.38 (3.23)	200 (93)	55 (13)	28.89 (97.83)
463.45 (345.59)	37643 (167.44)	4.62 (7.44)	1802	2.7	8th Gear 0.425 (0.258)	16.58 (3.27)	202 (94)	57 (14)	28.88 (97.80)
460.31 (343.25)	33609 (149.50)	5.14 (8.26)	1801	2.3	9th Gear 0.426 (0.259)	16.53 (3.26)	207 (97)	58 (14)	28.86 (97.73)
460.84 (343.65)	30203 (134.35)	5.73 (9.21)	1801	1.9	10th Gear 0.426 (0.259)	16.52 (3.25)	209 (98)	59 (15)	28.86 (97.73)
463.64 (345.73)	27405 (121.90)	6.35 (10.21)	1801	1.7	11th Gear 0.424 (0.258)	16.61 (3.27)	207 (97)	59 (15)	28.84 (97.66)
466.58 (347.93)	24714 (109.93)	7.08 (11.39)	1800	1.5	12th Gear 0.422 (0.256)	16.70 (3.29)	211 (99)	60 (15)	28.84 (97.66)
460.92 (343.71)	22062 (98.14)	7.84 (12.61)	1799	1.3	13th Gear 0.425 (0.259)	16.55 (3.26)	209 (98)	62 (17)	28.84 (97.66)
464.62 (346.47)	19914 (88.58)	8.75 (14.08)	1800	1.1	14th Gear 0.423 (0.257)	16.65 (3.28)	216 (102)	62 (17)	28.83 (97.63)

## HYDRAULIC PERFORMANCE

CATEGORY: 4

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range: lift cylinders  
15959 lbs(71.0 kN) (1 x 90 mm and 1x100 mm)  
21123 lbs(94.0 kN) (2 x 110 mm)

**High flow pump** **Base pump**

three outlet sets combined

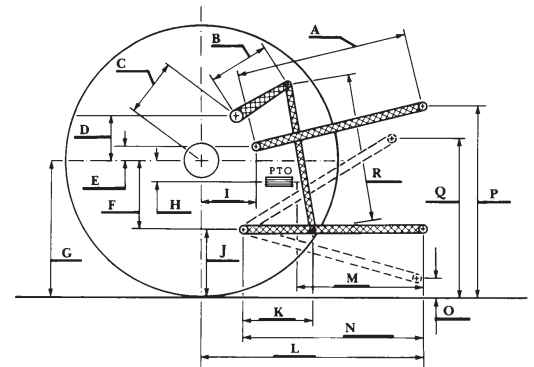
i) Sustained pressure at compensator cutoff:	2898 psi (200 bar)	2938 psi (203 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	52.7 GPM (199.6 l/min)	32.0 GPM (121.1 l/min)
Combined flow:	84.7 GPM (320.7 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	52.6 GPM (199.0 l/min)	31.5 GPM (119.2 l/min)
Delivery pressure:	2490 psi (172 bar)	2765 psi (191 bar)
Power:	76.4 HP (56.9 kW)	50.8 HP (37.9 kW)

	single outlet set	
i) Sustained pressure at compensator cutoff:	2910 psi (201 bar)	2938 psi (203 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	38.3 GPM (145.0 l/min)	31.8 GPM (120.2 l/min)
iii) Pump delivery rate at maximum hydraulic power:	37.3 GPM (141.0 l/min)	31.5 GPM (119.2 l/min)
Delivery pressure:	2111 psi (145 bar)	2414 psi (166 bar)
Power:	45.9 HP (34.2 kW)	44.3 HP (33.1 kW)

## HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	31.5	800
B	19.7	500
C	25.0	635
D	24.4	620
E	12.8	325
F	13.8	350
G	37.6	955
H	4.2	106
I	18.7	474
J	23.8	605
K	30.9	785
L	52.8	1342
*L'	59.6	1515
M	35.5	901
N	45.6	1159
O	9.0	230
P	50.8	1291
Q	39.8	1010
R	48.0	1220

\*L' to Quick Attach ends



## JOHN DEERE 9510R DIESEL

Institute of Agriculture and Natural Resources  
University of Nebraska–Lincoln