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2016

Test 2171: John Deere 9520RX

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2171-SUMMARY 1052

JOHN DEERE 9520RX DIESEL

18 SPEED

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
MAXIMUM POWER AND FUEL CONSUMPTION						
SEE NOTE 1 - PAGE 2						
Rated Engine Speed—(PTO speed—1109 rpm)						
310.96 (231.88)	2101	20.09 (76.03)	0.452 (0.275)	15.48 (3.05)	0.35 (1.34)	Fuel used during active exhaust regeneration-2.99 gal (11.32 l) (see note 2, p.2)
Standard Power Take-off Speed(1000 rpm)						
349.09 (260.32)	1895	20.41 (77.27)	0.409 (0.249)	17.10 (3.37)	0.32 (1.20)	
Maximum Power (1 hour)						
362.53 (270.34)	1701	20.03 (75.81)	0.387 (0.235)	18.10 (3.57)	0.32 (1.22)	

VARYING POWER AND FUEL CONSUMPTION

310.96 (231.88)	2101	20.09 (76.03)	0.452 (0.275)	15.48 (3.05)	0.35 (1.34)	Air temperature
270.43 (201.66)	2150	18.73 (70.90)	0.485 (0.295)	14.44 (2.84)	0.36 (1.35)	73°F (23°C)
203.07 (151.43)	2150	15.75 (59.62)	0.543 (0.330)	12.89 (2.54)	0.28 (1.07)	Relative humidity
135.55 (101.08)	2151	12.77 (48.35)	0.660 (0.401)	10.61 (2.09)	0.22 (0.83)	36%
67.73 (50.51)	2150	9.78 (37.03)	1.011 (0.615)	6.92 (1.36)	0.18 (0.68)	Barometer
1.69 (1.26)	2150	7.23 (27.35)	29.949 (18.218)	0.23 (0.05)	0.13 (0.51)	28.54" Hg (96.64 kPa)

Maximum Torque - 1216 lb-ft (1648 Nm) at 1552 rpm

Maximum Torque Rise -56.4%

Torque rise at 1681 engine rpm - 46%

Power increase at 1701 engine rpm - 16.6%

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)	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—7th Gear- Manual mode										
397.87 (296.69)	29742 (132.30)	5.02 (8.08)	2099	2.7	0.464 (0.282)	15.10 (2.97)	0.010 (0.006)	191 (88)	53 (12)	28.27 (95.73)
75% of Pull at Rated Engine Speed—7th Gear- Manual mode										
310.97 (231.89)	22287 (99.14)	5.23 (8.42)	2165	1.7	0.493 (0.300)	14.19 (2.80)	0.012 (0.007)	190 (88)	60 (16)	28.30 (95.84)
50% of Pull at Rated Engine Speed—7th Gear- Manual mode										
211.06 (157.39)	14854 (66.07)	5.33 (8.58)	2186	0.9	0.577 (0.351)	12.13 (2.39)	0.011 (0.007)	188 (87)	59 (15)	28.31 (95.87)
75% of Pull at Reduced Engine Speed—5.3 mph (8.6 km/h)-Auto mode										
310.70 (231.69)	22255 (99.00)	5.24 (8.42)	1584	1.7	0.425 (0.259)	16.45 (3.24)	0.007 (0.004)	194 (90)	60 (16)	28.33 (95.94)
50% of Pull at Reduced Engine Speed—5.3 mph (8.6 km/h)-Auto mode										
210.69 (157.11)	14975 (66.61)	5.28 (8.50)	1288	0.8	0.442 (0.269)	15.86 (3.12)	0.007 (0.004)	191 (88)	59 (15)	28.32 (95.90)

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

Dates of tests: November 17 - 30, 2016

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)** 0.8408 **Fuel weight** 7.001 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** CJ-4 **Transmission, hydraulic and final drive lubricant** John Deere Hy-Gard fluid **Total time engine was operated:** 27.5 hours

ENGINE: Make John Deere **Diesel Type** six cylinder vertical with two turbochargers, air to air aftercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** *RG6135U007816* **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 transmission/ hydraulic oil also feeding front and rear axles **Fuel filter** two paper cartridges **Fuel cooler** radiator for returned 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** 3 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: Stationary PTO operation (395 engine hp) 137.3 - 148.8 lb/h (62.3 - 67.5 kg/h), Drawbar operations (520 engine hp) 177.6 - 192.1 lb/h (80.6 - 87.2 kg/h) **High idle:** 2215 - 2265 rpm (2125 - 2175 rpm with PTO engaged) **Turbo boost:** (520 engine hp) nominal 33.3 - 39.2 psi (230 - 270 kPa) as measured 35.5 psi (245 kPa)

CHASSIS: Type 4WD with rubber tracks **Serial No.** *1RW9520RVGP801140* **Track width** rear 88.0" (2235 mm) front 88.0" (2235 mm) **Wheelbase** 163.5" (4154 mm) **Length of track on ground** 72.4" (1839 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 2.50 (4.03) second 3.08 (4.96) third 3.41 (5.48) fourth 3.81 (6.13) fifth 4.19 (6.75) sixth 4.69 (7.55) seventh 5.18 (8.34) eighth 5.76 (9.27) ninth 6.38 (10.27) tenth 7.09 (11.41) eleventh 7.84 (12.61) twelfth 8.71 (14.02) thirteenth 9.64 (15.52) fourteenth 10.73 (17.26)

DRAWBAR PERFORMANCE

(Unballasted at 2100 engine rpm, Manual mode)

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)	
310.33 (231.41)	53737 (239.03)	2.17 (3.48)	2100	13.1	1st Gear 0.534 (0.325)	13.11 (2.58)	0.013 (0.008)	190 (88)	44 (7)	28.26 (95.70)
333.24 (248.49)	43629 (194.07)	2.87 (4.61)	2101	6.7	2nd Gear 0.498 (0.303)	14.07 (2.77)	0.012 (0.007)	190 (88)	43 (6)	28.27 (95.73)
362.76 (270.51)	42819 (190.47)	3.18 (5.12)	2100	6.3	3rd Gear 0.479 (0.292)	14.61 (2.88)	0.012 (0.007)	194 (90)	54 (12)	27.88 (94.41)
386.67 (288.34)	40608 (180.63)	3.57 (5.75)	2100	5.9	4th Gear 0.478 (0.291)	14.65 (2.89)	0.010 (0.006)	193 (89)	58 (14)	28.29 (95.80)
391.31 (291.80)	36936 (164.30)	3.97 (6.39)	2099	4.8	5th Gear 0.473 (0.287)	14.82 (2.92)	0.011 (0.006)	194 (90)	59 (15)	28.28 (95.77)
392.15 (292.42)	32606 (145.04)	4.51 (7.26)	2099	3.4	6th Gear 0.469 (0.285)	14.92 (2.94)	0.010 (0.006)	191 (88)	54 (12)	28.27 (95.73)
397.87 (296.69)	29742 (132.30)	5.02 (8.08)	2099	2.7	7th Gear 0.464 (0.282)	15.10 (2.97)	0.010 (0.006)	191 (88)	53 (12)	28.27 (95.73)
397.94 (296.74)	26614 (118.38)	5.61 (9.03)	2100	2.2	8th Gear 0.463 (0.282)	15.11 (2.98)	0.010 (0.006)	190 (88)	51 (11)	28.26 (95.70)
392.42 (292.63)	23592 (104.94)	6.24 (10.04)	2099	1.8	9th Gear 0.468 (0.285)	14.96 (2.95)	0.011 (0.007)	194 (90)	54 (12)	28.29 (95.80)
390.02 (290.83)	21038 (93.58)	6.95 (11.18)	2099	1.4	10th Gear 0.471 (0.286)	14.88 (2.93)	0.011 (0.007)	193 (89)	55 (13)	28.28 (95.77)
388.19 (289.47)	18884 (84.00)	7.71 (12.41)	2100	1.2	11th Gear 0.473 (0.288)	14.80 (2.92)	0.012 (0.007)	194 (90)	56 (13)	28.27 (95.73)
385.88 (287.75)	16859 (74.99)	8.58 (13.81)	2099	1.0	12th Gear 0.474 (0.289)	14.76 (2.91)	0.012 (0.007)	195 (90)	57 (14)	28.30 (95.84)

fifteenth 13.26 (21.34) sixteenth 16.32 (26.26) seventeenth 20.04 (32.25) eighteenth 24.67 (39.70) reverse 2.50 (4.03), 3.41 (5.48), 3.81 (6.13), 5.18 (8.34), 5.76 (9.27), 7.84 (12.61) **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1000 rpm at 1895 engine rpm **Unladen tractor mass** 57395 lb (26034 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1. In stationary PTO operation, this model operates in a derated power mode. With stationary PTO operation, using FieldCruise™, an isochronous governor is utilized. All PTO tests were conducted with FieldCruise™ engaged.

NOTE 2. The manufacturer declares that the average time between active regenerations is 50 hours.

NOTE 3: This tractor has a driveline protection system that limits the maximum engine torque in gears 1 through 3.

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. **2171**, Nebraska Summary 1052, March 3, 2017.

Roger M. Hoy
Director

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

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 6th gear	72.2
Transport speed - no load - 18th gear	74.3
Bystander in 17th gear	89.6

TRACKS AND WEIGHT

Rear tracks - no & size
Front tracks - no & size
Height of drawbar
Static weight with operator- Rear
- Front
- Total

Tested Without Ballast

2 x 30.0 in (760 mm)
2 x 30.0 in (760 mm)
21.0 in (545 mm)
25710 lb (11662 kg)
31860 lb (14451 kg)
57570 lb (26113 kg)

DRAWBAR PERFORMANCE
UNBALLASTED - AUTO MODE
(Loads based on 2100 engine rpm manual mode performance runs)
DRAWBAR POWER AT SELECTED TRAVEL SPEEDS

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)
3.9 mph (6.2 km/h)										
386.76 (288.40)	40105 (178.40)	3.62 (5.83)	1726	5.8	0.438 (0.267)	15.97 (3.15)	0.008 (0.005)	202 (94)	58 (15)	28.29 (95.80)
4.2 mph (6.8 km/h)										
391.30 (291.79)	36531 (162.50)	4.02 (6.47)	1713	4.6	0.426 (0.259)	16.42 (3.24)	0.007 (0.004)	203 (95)	59 (15)	28.31 (95.87)
4.7 mph (7.6 km/h)										
391.46 (291.91)	32261 (143.50)	4.55 (7.32)	1723	3.3	0.422 (0.256)	16.60 (3.27)	0.008 (0.005)	199 (93)	54 (12)	28.28 (95.77)
5.2 mph (8.4 km/h)										
397.90 (296.71)	29496 (131.20)	5.06 (8.14)	1719	2.7	0.425 (0.258)	16.48 (3.25)	0.007 (0.004)	199 (93)	54 (12)	28.27 (95.73)
5.7 mph (9.2 km/h)										
397.21 (296.20)	26765 (119.05)	5.57 (8.96)	1694	2.2	0.423 (0.257)	16.54 (3.26)	0.008 (0.005)	200 (93)	52 (11)	28.27 (95.73)
6.3 mph (10.2 km/h)										
392.75 (292.87)	23749 (105.64)	6.20 (9.98)	1699	1.8	0.423 (0.257)	16.54 (3.26)	0.008 (0.005)	204 (96)	55 (13)	28.29 (95.80)
7.1 mph (11.4 km/h)										
390.22 (290.99)	21044 (93.61)	6.95 (11.18)	1899	1.4	0.438 (0.267)	15.97 (3.15)	0.009 (0.005)	197 (91)	56 (13)	28.28 (95.77)
7.8 mph (12.6 km/h)										
388.05 (289.37)	18890 (84.03)	7.71 (12.40)	1888	1.2	0.441 (0.268)	15.88 (3.13)	0.009 (0.005)	198 (92)	56 (13)	28.28 (95.77)
8.7 mph (14.0 km/h)										
385.51 (287.47)	16852 (74.96)	8.58 (13.81)	1895	1.1	0.453 (0.275)	15.46 (3.05)	0.009 (0.005)	199 (93)	57 (14)	28.30 (95.84)

DRAWBAR PERFORMANCE
(Unballasted at 1750 ENGINE RPM, Manual mode)
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)
312.50 (233.03)	55230 (245.68)	2.13 (3.42)	2082	14.2	1st Gear 0.537 (0.326)	13.05 (2.57)	0.012 (0.007)	190 (88)	44 (7)	28.27 (95.73)
356.44 (265.79)	51606 (229.55)	2.60 (4.18)	2000	11.4	2nd Gear 0.500 (0.304)	14.01 (2.76)	0.011 (0.007)	193 (89)	43 (6)	28.30 (95.84)
389.40 (290.38)	50785 (225.90)	2.88 (4.63)	1989	10.5	3rd Gear 0.482 (0.293)	14.52 (2.86)	0.010 (0.006)	194 (90)	43 (6)	28.29 (95.80)
417.70 (311.48)	49165 (218.69)	3.19 (5.13)	1951	9.6	4th Gear 0.479 (0.291)	14.63 (2.88)	0.009 (0.006)	195 (91)	43 (6)	28.28 (95.77)
431.45 (321.73)	45969 (204.48)	3.52 (5.66)	1918	7.7	5th Gear 0.462 (0.281)	15.16 (2.99)	0.009 (0.006)	198 (92)	42 (6)	28.29 (95.80)
437.81 (326.47)	42115 (187.34)	3.90 (6.28)	1863	5.9	6th Gear 0.450 (0.274)	15.54 (3.06)	0.009 (0.005)	201 (94)	42 (6)	28.30 (95.84)
440.98 (328.84)	40775 (181.37)	4.06 (6.53)	1750	5.7	7th Gear 0.436 (0.265)	16.06 (3.16)	0.009 (0.006)	217 (103)	54 (12)	27.89 (94.45)
446.84 (333.20)	36687 (163.19)	4.57 (7.35)	1750	4.4	8th Gear 0.429 (0.261)	16.33 (3.22)	0.009 (0.005)	217 (103)	54 (12)	27.89 (94.45)
445.24 (332.02)	32662 (145.29)	5.11 (8.22)	1750	3.4	9th Gear 0.431 (0.262)	16.23 (3.20)	0.009 (0.005)	218 (103)	54 (12)	27.91 (94.51)
446.53 (332.98)	29266 (130.18)	5.72 (9.21)	1750	2.8	10th Gear 0.431 (0.262)	16.25 (3.20)	0.009 (0.005)	217 (103)	52 (11)	27.94 (94.62)
447.59 (333.77)	26407 (117.46)	6.36 (10.24)	1750	2.3	11th Gear 0.430 (0.261)	16.29 (3.21)	0.009 (0.005)	217 (103)	53 (11)	27.94 (94.62)
450.48 (335.92)	23813 (105.92)	7.10 (11.42)	1750	1.8	12th Gear 0.427 (0.260)	16.40 (3.23)	0.009 (0.005)	217 (103)	52 (11)	27.92 (94.55)
441.86 (329.50)	21026 (93.53)	7.88 (12.68)	1750	1.5	13th Gear 0.438 (0.266)	15.99 (3.15)	0.009 (0.006)	217 (103)	54 (12)	27.94 (94.62)
446.74 (333.13)	19068 (84.82)	8.79 (14.14)	1751	1.3	14th Gear 0.433 (0.263)	16.16 (3.18)	0.009 (0.005)	217 (103)	54 (12)	27.90 (94.48)

Lugging ability in 11th gear

Crankshaft speed rpm	2099	1999	1900	1849	1750	1600	1400	1100
Pull-lbs (kN)	18690 (83.14)	21884 (97.34)	24032 (106.90)	24855 (110.56)	26475 (117.77)	27840 (123.84)	27268 (121.29)	25155 (111.89)
Increase in pull%	0	17	29	33	42	49	46	35
Power-Hp (kW)	383.89 (286.26)	425.87 (317.57)	443.05 (330.38)	445.74 (332.38)	448.12 (334.16)	429.80 (320.50)	368.78 (275.00)	268.22 (200.01)
Speed-mpH (km/h)	7.71 (12.40)	7.30 (11.75)	6.92 (11.13)	6.73 (10.82)	6.35 (10.22)	5.79 (9.32)	5.07 (8.16)	4.00 (6.44)
Slip %		1.2	1.8	2.1	2.2	2.4	2.6	2.5

HYDRAULIC PERFORMANCE

CATEGORY: 4N/4

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range:

Category 4N lift cylinders
15648 lbs(69.6 kN) (1 x 90 mm and 1x100 mm)
20965 lbs(93.3 kN) (2 x 110 mm)

Category 4
15501 lbs(69.0 kN) (1 x 90 mm and 1x100 mm)
20527 lbs(91.3 kN) (2 x 110 mm)

Base pump Tandem pump
three outlet sets combined

2904 psi (200 bar) 2933 psi (202 bar)

i) Sustained pressure at compensator cutoff:

ii) Pump delivery rate at minimum pressure and rated engine speed:

59.2 GPM (224.2 l/min) 56.9 GPM (215.4 l/min)

Combined flow:

116.1 GPM (439.6 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

59.6 GPM (225.7 l/min) 57.2 GPM (216.5 l/min)

Delivery pressure:

2482 psi (171 bar) 2403 psi (166 bar)

Power:

86.4 HP (64.4 kW) 80.2 HP (59.8 kW)

single outlet set

3/4" couplers 1/2" couplers

2856 psi (197 bar) 2902 psi (200 bar)

i) Sustained pressure at compensator cutoff:

ii) Pump delivery rate at minimum pressure and rated engine speed:

43.1 GPM (163.2 l/min) 36.4 GPM (137.9 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

42.5 GPM (160.9 l/min) 35.5 GPM (134.3 l/min)

Delivery pressure:

2226 psi (153 bar) 2194 psi (151 bar)

Power:

55.2 HP (41.2 kW) 45.4 HP (33.9 kW)

Category 4N

inch mm

A	30.7	780
B	19.7	500
C	34.8	885
D	28.7	730
E	18.7	475
F	12.5	318
G	33.1	842
*G'	19.5	495
H	2.2	57
I	28.8	733
J	20.6	524
K	30.9	785
L	52.8	1342
*L'	58.7	1491
M	14.7	374
N	45.6	1159
O	9.0	230
P	47.6	1210
Q	40.6	1032
R	49.6	1260

Category 4

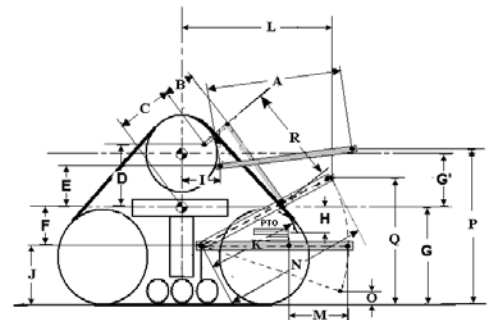
inch mm

A	29.9	760
B	19.7	500
C	34.8	885
D	28.7	730
E	18.7	475
F	12.5	318
G	33.1	842
*G'	19.5	495
H	2.2	57
I	28.8	733
J	20.6	524
K	30.9	785
L	52.8	1342
*L'	59.6	1515
M	14.7	374
N	45.6	1159
O	9.0	230
P	47.6	1210
Q	40.4	1027
R	48.6	1260

*G' to undercarriage pivot point

*L' to Quick Attach ends

HITCH DIMENSIONS AS TESTED—NO LOAD



JOHN DEERE 9520RX DIESEL

Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln