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Test 1805: John Deere 9520 18 Speed

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NEBRASKA OECD TRACTOR TEST 1805—SUMMARY 371

JOHN DEERE 9520 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
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1108 rpm)					
333.27 (248.52)	2100	19.40 (73.46)	0.410 (0.249)	17.17 (3.38)	
Standard Power Take-off Speed—(PTO speed—1000 rpm)					
359.14 (267.81)	1896	19.37 (73.31)	0.380 (0.231)	18.54 (3.65)	
Maximum Power (2 hours)					
370.54 (276.31)	1800	19.87 (75.20)	0.378 (0.230)	18.65 (3.67)	

VARYING POWER AND FUEL CONSUMPTION

333.27 (248.52)	2100	19.40 (73.46)	0.410 (0.249)	17.17 (3.38)	Air temperature
290.89 (216.91)	2156	17.81 (67.41)	0.431 (0.262)	16.34 (3.22)	75°F (24°C)
220.03 (164.07)	2173	15.04 (56.93)	0.481 (0.293)	14.63 (2.88)	Relative humidity
147.72 (110.16)	2195	11.67 (44.19)	0.556 (0.338)	12.66 (2.49)	21%
74.63 (55.65)	2217	8.31 (31.45)	0.784 (0.477)	8.98 (1.77)	Barometer
1.12 (0.84)	2237	4.94 (18.71)	30.979 (18.844)	0.23 (0.04)	28.60" Hg (96.85 kPa)

Maximum Torque - 1231 lb.-ft. (1670 Nm) at 1150 rpm
 Maximum Torque Rise - 47.7%
 Torque rise at 1702 engine rpm - 36%

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)
Maximum Power—7th Gear									
350.08 (261.05)	28230 (125.57)	4.65 (7.48)	2099	3.32	0.421 (0.256)	16.74 (3.30)	188 (86)	51 (11)	29.03 (98.31)
75% of Pull at Maximum Power—7th Gear									
273.31 (203.81)	21140 (94.04)	4.85 (7.80)	2167	2.44	0.466 (0.284)	15.10 (2.98)	189 (87)	66 (19)	28.86 (97.73)
50% of Pull at Maximum Power—7th Gear									
186.09 (138.77)	14146 (62.92)	4.93 (7.94)	2188	1.63	0.540 (0.329)	13.04 (2.57)	184 (84)	68 (20)	28.85 (97.70)
75% of Pull at Reduced Engine Speed—9th Gear									
273.80 (204.17)	21144 (94.05)	4.86 (7.82)	1765	2.44	0.434 (0.264)	16.25 (3.20)	186 (86)	67 (19)	28.85 (97.70)
50% of Pull at Reduced Engine Speed—9th Gear									
185.77 (138.53)	14141 (62.90)	4.93 (7.93)	1775	1.63	0.476 (0.290)	14.80 (2.92)	180 (82)	71 (22)	28.85 (97.70)

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

Dates of Test: March 28- May 31, 2002

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) 0.8461 Fuel weight 7.045 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: 42.0 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** *RG6125H031903* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** (as specified) 5.00" x 6.50" (127.0 mm x 165.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 765 cu in (12536 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 front and rear axle oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: (375 engine hp) 128.5 - 141.7 lb/h (58.3-64.3 kg/h), (400 engine hp) 134.4 - 148.2 lb/h (61.0-67.2 kg/h), (425 engine hp) 139.6 - 153.9 lb/h (63.3-69.8 kg/h), (450 engine hp) 149.1 - 164.4 lb/h (67.6-74.6 kg/h) **High idle:** 2205 - 2255 rpm **Turbo boost:** nominal 21.8 - 24.7 psi (150 - 170 kPa) as measured 22.3 psi (154 kPa)

CHASSIS: Type four wheel drive with duals **Serial No.** *RW9520P001254* **Tread width** rear 68.4" (1500 mm) to 143.9" (4105 mm) front 68.4" (1500 mm) to 143.9" (4105 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 2.31 (3.72) second 2.85 (4.58) third 3.15 (5.07) fourth 3.52 (5.66) fifth 3.88 (6.25) sixth 4.33 (6.97) seventh 4.80 (7.72) eighth 5.36 (8.62) ninth 5.90 (9.49) tenth 6.59 (10.60) eleventh 7.30 (11.74) twelfth 8.06 (12.97) thirteenth 8.98 (14.45) fourteenth 9.92 (15.97) fifteenth 12.27 (19.74) sixteenth 15.09 (24.29) seventeenth 18.66 (30.03) eighteenth 22.97 (36.96) reverse 2.31 (3.72), 3.15 (5.07), 3.52 (5.66), 4.80 (7.72), 5.36 (8.62), 7.30 (11.74)

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. °C Air dry bulb	Barom. inch Hg (kPa)	
1st Gear									
235.70 (175.76)	40323 (179.37)	2.19 (3.53)	2164	8.46	0.504 (0.307)	13.97 (2.75)	181 (83)	49 (9)	29.03 (98.31)
2nd Gear									
283.51 (211.41)	40005 (177.95)	2.66 (4.28)	2120	7.75	0.464 (0.282)	15.19 (2.99)	183 (84)	49 (9)	29.03 (98.31)
3rd Gear									
299.71 (223.49)	37808 (168.18)	2.97 (4.78)	2101	6.04	0.443 (0.269)	15.90 (3.13)	184 (84)	50 (10)	29.04 (98.34)
4th Gear									
303.10 (226.02)	33627 (149.58)	3.38 (5.44)	2102	4.53	0.442 (0.269)	15.93 (3.14)	185 (85)	50 (10)	29.05 (98.37)
5th Gear									
325.70 (242.87)	32720 (145.55)	3.73 (6.01)	2100	4.19	0.435 (0.265)	16.19 (3.19)	185 (85)	51 (11)	29.06 (98.41)
6th Gear									
324.44 (241.93)	28980 (128.91)	4.20 (6.76)	2099	3.41	0.436 (0.265)	16.16 (3.18)	187 (86)	51 (11)	29.06 (98.41)
7th Gear									
350.08 (261.05)	28230 (125.57)	4.65 (7.48)	2099	3.32	0.421 (0.256)	16.74 (3.30)	188 (86)	51 (11)	29.03 (98.31)
8th Gear									
369.88 (275.82)	26612 (118.37)	5.21 (8.39)	2101	3.06	0.425 (0.258)	16.58 (3.27)	193 (89)	51 (11)	29.01 (98.24)
9th Gear									
368.69 (274.93)	23991 (106.72)	5.76 (9.27)	2100	2.80	0.424 (0.258)	16.61 (3.27)	191 (88)	51 (11)	28.99 (98.17)
10th Gear									
368.31 (274.65)	21385 (95.12)	6.46 (10.39)	2101	2.44	0.429 (0.261)	16.43 (3.24)	191 (88)	51 (11)	28.98 (98.14)
11th Gear									
367.88 (274.33)	19271 (85.72)	7.16 (11.52)	2098	2.26	0.431 (0.262)	16.36 (3.22)	192 (89)	51 (11)	28.95 (98.04)
12th Gear									
368.11 (274.50)	17395 (77.38)	7.94 (12.77)	2102	2.08	0.426 (0.259)	16.55 (3.26)	192 (89)	51 (11)	28.93 (97.97)
13th Gear									
360.92 (269.14)	15321 (68.15)	8.83 (14.22)	2095	1.90	0.433 (0.263)	16.27 (3.21)	193 (89)	52 (11)	28.93 (97.97)

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires - No., size, ply & psi(kPa)	Six 480/80R46;***;9(60)	Six 480/80R46;***;7(50)
Ballast - Liquid (total)	None	None
- Cast Iron (total)	3125 lb (1417 kg)	None
Front Tires - No., size, ply & psi(kPa)	Six 480/80R46;***;14(95)	Six 480/80R46;***;12(75)
Ballast - Liquid (total)	None	None
- Cast Iron (total)	3145 lb (1428 kg)	None
Height of Drawbar	19.5 in (495 mm)	19.5 in (495 mm)
Static Weight with operator - Rear	19140 lb (8682 kg)	16015 lb (7264 kg)
- Front	25620 lb(11621 kg)	22475 lb(10194 kg)
- Total	44760 lb(20303 kg)	38490 lb(17458 kg)

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** 38315 lb (17379 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE: The 9520 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 375 hp when the transmission is in forward gears 1 through 4 or when the tractor is being used for stationary PTO operations. At 2100 rpm the engine produces 400 hp when the transmission is in gears 5 and 6. At 2100 rpm the engine produces 425 hp when the transmission is in gear 7. At 2100 rpm the engine produces 450 hp in all other applications.

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 injection pump inlet was maintained at 106°F (41°C). The pull in 1st gear was limited to avoid tractor bouncing. 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. **1805**, Nebraska Summary 371, July 23, 2002.

Brent T. Sampson
Test Engineer

L.L. Bashford
G.J. Hoffinan
V.I. Adamchuck
Board of Tractor Test Engineers

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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
1st Gear									
235.55 (175.65)	40365 (179.55)	2.19 (3.52)	2164	8.61	0.510 (0.310)	13.82 (2.72)	181 (83)	49 (9)	29.03 (98.31)
2nd Gear									
284.68 (212.28)	40129 (178.50)	2.66 (4.28)	2118	7.59	0.454 (0.276)	15.52 (3.06)	182 (83)	49 (9)	29.03 (98.31)
3rd Gear									
301.52 (224.84)	38910 (173.08)	2.91 (4.68)	2074	6.70	0.453 (0.276)	15.54 (3.06)	184 (84)	50 (10)	29.04 (98.34)
4th Gear									
314.50 (234.52)	38042 (169.22)	3.10 (4.99)	1972	6.62	0.428 (0.261)	16.45 (3.24)	186 (86)	50 (10)	29.05 (98.37)
5th Gear									
338.45 (252.38)	37972 (168.91)	3.34 (5.38)	1930	6.54	0.428 (0.260)	16.46 (3.24)	184 (84)	51 (11)	29.04 (98.34)
6th Gear									
348.14 (259.61)	36515 (162.43)	3.58 (5.75)	1830	5.63	0.424 (0.258)	16.61 (3.27)	189 (87)	51 (11)	29.05 (98.37)
7th Gear									
372.60 (277.85)	35734 (158.95)	3.91 (6.29)	1801	5.25	0.422 (0.257)	16.69 (3.29)	193 (89)	51 (11)	29.05 (98.37)
8th Gear									
405.33 (302.26)	34745 (154.55)	4.37 (7.04)	1798	4.79	0.427 (0.260)	16.50 (3.25)	189 (87)	51 (11)	29.02 (98.27)
9th Gear									
407.82 (304.11)	31321 (139.32)	4.88 (7.86)	1801	4.02	0.421 (0.256)	16.73 (3.30)	185 (85)	51 (11)	28.99 (98.17)
10th Gear									
407.63 (303.97)	27870 (123.97)	5.48 (8.83)	1800	3.32	0.422 (0.257)	16.69 (3.29)	190 (88)	51 (11)	28.97 (98.10)
11th Gear									
409.08 (305.05)	25146 (111.85)	6.10 (9.82)	1801	2.80	0.422 (0.257)	16.69 (3.29)	190 (88)	51 (11)	28.96 (98.07)
12th Gear									
411.97 (307.21)	22877 (101.76)	6.75 (10.87)	1799	2.53	0.415 (0.253)	16.96 (3.34)	193 (89)	51 (11)	28.94 (98.00)
13th Gear									
402.56 (300.19)	20008 (89.00)	7.55 (12.14)	1799	2.26	0.424 (0.258)	16.63 (3.28)	189 (87)	52 (11)	28.93 (97.97)
14th Gear									
409.95 (305.70)	18402 (81.85)	8.35 (13.44)	1800	2.08	0.423 (0.257)	16.66 (3.28)	194 (90)	53 (12)	28.93 (97.97)

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 7th gear	77.1
Transport speed - no load - 18th gear	77.4
Bystander in 18th gear	91.1

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)
1st Gear									
267.70 (199.62)	46190 (205.46)	2.17 (3.50)	2154	8.56	0.495 (0.301)	14.23 (2.80)	182 (83)	54 (12)	28.78 (97.46)
2nd Gear									
301.08 (224.52)	44032 (195.86)	2.56 (4.13)	2030	6.97	0.448 (0.273)	15.71 (3.10)	186 (85)	55 (13)	28.78 (97.46)
3rd Gear									
314.61 (234.61)	43525 (193.61)	2.71 (4.36)	1945	7.22	0.429 (0.261)	16.41 (3.23)	187 (86)	56 (13)	28.78 (97.46)
4th Gear									
314.95 (234.86)	40166 (178.66)	2.94 (4.73)	1892	7.30	0.430 (0.261)	16.39 (3.23)	189 (87)	65 (18)	28.81 (97.56)
5th Gear									
339.14 (252.89)	39221 (174.46)	3.24 (5.22)	1892	7.13	0.429 (0.261)	16.42 (3.23)	188 (86)	66 (19)	28.81 (97.56)
6th Gear									
347.00 (258.76)	36780 (163.60)	3.54 (5.69)	1820	5.83	0.427 (0.260)	16.50 (3.25)	190 (88)	67 (19)	28.81 (97.56)
7th Gear									
370.67 (276.41)	35552 (158.14)	3.91 (6.29)	1809	5.41	0.423 (0.257)	16.64 (3.28)	191 (88)	67 (19)	28.81 (97.56)
8th Gear									
411.56 (306.90)	34857 (155.05)	4.43 (7.13)	1804	3.80	0.419 (0.255)	16.80 (3.31)	190 (88)	60 (16)	28.78 (97.46)
9th Gear									
410.67 (306.24)	31402 (139.68)	4.90 (7.89)	1807	3.54	0.418 (0.254)	16.85 (3.32)	188 (87)	65 (18)	28.81 (97.56)
10th Gear									
410.26 (305.93)	28044 (124.74)	5.49 (8.83)	1797	2.84	0.422 (0.256)	16.71 (3.29)	194 (90)	62 (17)	28.79 (97.49)
11th Gear									
408.48 (304.60)	25042 (111.39)	6.12 (9.84)	1805	2.57	0.420 (0.255)	16.78 (3.31)	188 (87)	64 (18)	28.80 (97.53)
12th Gear									
414.08 (308.78)	22960 (102.13)	6.76 (10.88)	1802	2.22	0.415 (0.252)	16.98 (3.35)	195 (91)	63 (17)	28.79 (97.49)
13th Gear									
404.66 (301.76)	20121 (89.50)	7.54 (12.14)	1797	1.95	0.427 (0.260)	16.50 (3.25)	191 (88)	63 (17)	28.80 (97.53)
14th Gear									
407.21 (303.66)	18247 (81.17)	8.37 (13.47)	1801	1.77	0.421 (0.256)	16.73 (3.30)	192 (89)	64 (18)	28.80 (97.53)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III, IV

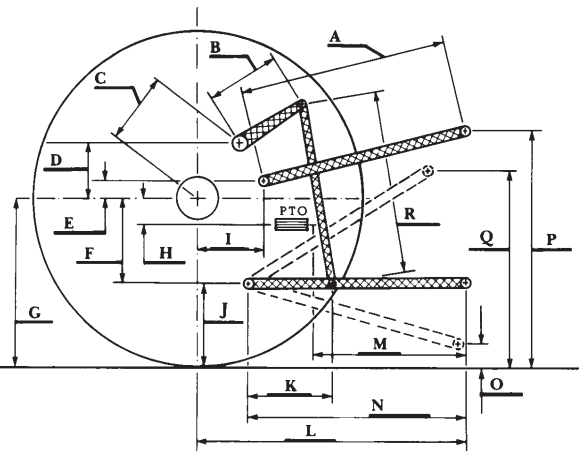
Quick Attach: yes

Maximum Force Exerted Through Whole Range: Category III
 13104 lbs (58.3 kN) (Cat. III hitch)
 14382 lbs (64.0 kN) (Cat. IV hitch)

i) Opening pressure of relief valve: NA
 Sustained pressure at compensator cutoff: 2950 psi (203 bar)
Single outlet set Two outlet sets combined

Pump delivery rate at minimum pressure and rated engine speed: 34.2 GPM (129.5 l/min) 50.1 GPM (189.6 l/min)

iii) Pump delivery rate at maximum hydraulic power: 28.9 GPM (109.4 l/min) 46.5 GPM (176.0 l/min)
 Delivery pressure: 2097 psi (145 bar) 2150 psi (148 bar)
 Power: 35.4 Hp (26.4 kW) 58.3 HP (43.5 kW)



THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar): 2950 (203)
 Location: remote outlet
 Hydraulic oil temperature: °F (°C): 147 (64)
 Location: hydraulic sump
 Category: III, IV
 Quick attach: yes

Category III (lift cylinders - 2x90 mm) SAE Static Test—System pressure 2575 psi (177 Bar)

Hitchpoint distance to ground level in. (mm)	8.0 (203)	16.0 (409)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb	14589	14463	14418	13995	12978
" " " " " " (kN)	(64.9)	(64.3)	(64.1)	(62.3)	(57.7)

ASAE Static Test—System pressure 2775 psi (191 Bar)

Hitchpoint distance to ground level in. (mm)	8.0 (203)	16.0 (409)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb	15715	15580	15531	15076	13980
" " " " " " (kN)	(69.9)	(69.3)	(69.1)	(67.1)	(62.2)

Category IV (lift cylinders - 1x90 mm & 1x100 mm) SAE Static Test - System pressure 2575 psi (177 Bar)

Hitchpoint distance to ground level in. (mm)	8.0 (203)	15.2 (386)	22.4 (569)	29.6 (752)	36.8 (935)	43.0 (1092)
Lift force on frame lb	16074	15908	16029	15696	14994	13518
" " " " " " (kN)	(71.5)	(70.8)	(71.3)	(69.8)	(66.7)	(60.1)

ASAE Static Test—System pressure 2775 psi (191 Bar)

Hitchpoint distance to ground level in. (mm)	8.0 (203)	15.2 (386)	22.4 (569)	29.6 (752)	36.8 (935)	43.0 (1092)
Lift force on frame lb	17199	17020	17208	16851	16152	14562
" " " " " " (kN)	(76.5)	(75.7)	(76.6)	(75.0)	(71.8)	(64.8)

HITCH DIMENSIONS AS TESTED—NO LOAD

	Category III		Category IV	
	inch	mm	inch	mm
A	30.8	780	30.3	770
B	18.6	472	18.6	472
C	26.2	666	26.2	666
D	24.4	620	24.4	620
E	11.3	288	11.3	288
F	13.8	350	13.8	350
G	35.6	905	35.6	905
H	4.8	122	4.8	122
I	22.7	577	22.7	577
J	21.9	555	21.8	555
K	28.8	731	28.3	718
L	55.3	1405	54.5	1384
*L'	61.8	1570	60.5	1537
M	25.4	645	24.6	625
N	44.0	1117	43.2	1097
O	8.0	203	8.0	203
P	48.6	1234	48.6	1234
Q	39.1	993	39.0	991
R	44.8	1137	45.0	1143

*L' to Quick Attach ends



JOHN DEERE 9520 DIESEL

Agricultural Research Division
 Institute of Agriculture and Natural Resources
 University of Nebraska-Lincoln
 Darrell Nelson, Dean and Director