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Test 1803: John Deere 9320 18 Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1803—SUMMARY 369

JOHN DEERE 9320 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)					
333.43 (248.64)	2100	18.97 (71.81)	0.401 (0.244)	17.58 (3.46)	
Standard Power Take-off Speed—(PTO speed—1000 rpm)					
364.94 (272.14)	1895	19.97 (75.61)	0.385 (0.234)	18.27 (3.60)	
Maximum Power (2 hours)					
377.55 (281.54)	1799	20.91 (79.16)	0.390 (0.237)	18.05 (3.56)	

VARYING POWER AND FUEL CONSUMPTION

333.43 (248.64)	2100	18.97 (71.81)	0.401 (0.244)	17.58 (3.46)	Air temperature
290.94 (216.95)	2156	17.30 (65.47)	0.419 (0.255)	16.82 (3.31)	74°F (23°C)
220.03 (164.07)	2173	14.48 (54.83)	0.464 (0.282)	15.19 (2.99)	Relative humidity
146.79 (109.46)	2189	12.01 (45.48)	0.576 (0.351)	12.22 (2.41)	29%
75.28 (56.13)	2213	8.48 (32.09)	0.793 (0.482)	8.88 (1.75)	Barometer
1.18 (0.88)	2233	5.11 (19.35)	30.547 (18.581)	0.23 (0.05)	29.11" Hg (98.58 kPa)

Maximum Torque - 1262 lb.-ft. (1711 Nm) at 1200 rpm

Maximum Torque Rise - 51.3%

Torque rise at 1700 engine rpm - 40%

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—6th Gear									
304.37 (226.97)	25837 (114.93)	4.42 (7.11)	2097	3.28	0.440 (0.268)	16.02 (3.15)	178 (81)	59 (15)	28.95 (98.03)
75% of Pull at Maximum Power—6th Gear									
237.03 (176.75)	19317 (85.92)	4.60 (7.41)	2167	2.51	0.485 (0.295)	14.53 (2.86)	178 (81)	54 (12)	29.20 (98.88)
50% of Pull at Maximum Power—6th Gear									
161.22 (120.22)	12920 (57.47)	4.68 (7.53)	2188	1.76	0.556 (0.338)	12.66 (2.49)	174 (79)	56 (13)	29.21 (98.92)
75% of Pull at Reduced Engine Speed—8th Gear									
237.29 (176.95)	19321 (85.94)	4.61 (7.41)	1755	2.51	0.444 (0.270)	15.88 (3.13)	177 (80)	55 (13)	29.20 (98.88)
50% of Pull at Reduced Engine Speed—8th Gear									
161.34 (120.31)	12933 (57.53)	4.68 (7.53)	1770	1.86	0.488 (0.297)	14.42 (2.84)	169 (76)	56 (13)	29.21 (98.92)

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

Dates of Test: April 9 - 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: 24.5 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** *RG6125H031928* **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: 126.0-138.9 lb/h (57.1-63.0 kg/h) **High idle:** 2205-2255 rpm **Turbo boost:** nominal 19.9-22.8 psi (137-157 kPa) as measured 21.1 psi (145 kPa)

CHASSIS: Type four wheel drive with duals **Serial No.** *RW9320P001054* **Tread width** rear 66.5" (1689 mm) to 142.3" (3615 mm), front 66.5" (1689 mm) to 142.3" (3615 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 2.44 (3.92) second 3.00 (4.83) third 3.32 (5.35) fourth 3.72 (5.98) fifth 4.09 (6.59) sixth 4.57 (7.36) seventh 5.06 (8.15) eighth 5.65 (9.09) ninth 6.23 (10.02) tenth 6.95 (11.19) eleventh 7.70 (12.39) twelfth 8.51 (13.69) thirteenth 9.47 (15.24) fourteenth 10.47 (16.85) fifteenth 12.94 (20.83) sixteenth 15.93 (25.63) seventeenth 19.69 (31.69) eighteenth 24.23 (39.00) reverse 2.43 (3.92), 3.32 (5.35), 3.72 (5.98), 5.06 (8.15), 5.65 (9.09), 7.70 (12.39)

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 (°C) cool- ing med	Barom. inch Hg (kPa)
1st Gear							
234.48 (174.86)	38306 (170.39)	2.30 (3.69)	2163	8.82	0.504 (0.307)	13.96 (2.75)	29.22 (98.95)
2nd Gear							
284.28 (211.98)	38050 (169.25)	2.80 (4.51)	2113	7.40	0.462 (0.281)	15.25 (3.00)	29.22 (98.95)
3rd Gear							
297.58 (221.90)	35823 (159.35)	3.12 (5.01)	2101	6.38	0.450 (0.274)	15.64 (3.08)	29.21 (98.92)
4th Gear							
303.09 (226.01)	32074 (142.67)	3.54 (5.70)	2100	4.62	0.440 (0.268)	16.01 (3.15)	29.21 (98.92)
5th Gear							
303.20 (226.10)	28850 (128.33)	3.94 (6.34)	2099	3.90	0.441 (0.268)	15.96 (3.14)	28.95 (98.04)
6th Gear							
304.37 (226.97)	25837 (114.93)	4.42 (7.11)	2097	3.17	0.440 (0.268)	16.02 (3.15)	28.95 (98.04)
7th Gear							
306.68 (228.69)	23356 (103.89)	4.92 (7.92)	2101	2.70	0.435 (0.265)	16.20 (3.19)	28.94 (98.00)
8th Gear							
304.89 (227.36)	20739 (92.25)	5.51 (8.87)	2099	2.51	0.441 (0.268)	15.97 (3.15)	28.93 (97.97)
9th Gear							
303.01 (225.95)	18668 (83.04)	6.09 (9.80)	2098	2.23	0.441 (0.268)	15.97 (3.15)	28.93 (97.97)
10th Gear							
297.69 (221.99)	16351 (72.73)	6.83 (10.99)	2100	1.95	0.448 (0.273)	15.72 (3.10)	28.94 (98.00)
11th Gear							
299.85 (223.60)	14909 (66.32)	7.54 (12.14)	2096	1.76	0.446 (0.271)	15.79 (3.11)	28.94 (98.00)
12th Gear							
296.72 (221.27)	13325 (59.27)	8.35 (13.44)	2097	1.67	0.452 (0.275)	15.60 (3.07)	28.95 (98.04)

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** 36560 lb (16583 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

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 99°F (37°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. **1803**, Nebraska Summary 369, July 23, 2002.

Brent T. Sampson
Test Engineer

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

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 6th gear	74.3
Transport speed - no load - 18th gear	76.9
Bystander in 18th gear	90.6

TIRES, BALLAST 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 620/70R46;***;7(50)

Four 620/70R46;***;11(75)

21.0 in (535 mm)

15185 lb (6888 kg)

21550 lb (9775 kg)

36735 lb (16663 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)
1st Gear									
235.38 (175.53)	38397 (170.80)	2.30 (3.70)	2164	8.65	0.502 (0.306)	14.03 (2.76)	175 (79)	48 (9)	29.22 (98.95)
2nd Gear									
283.51 (211.41)	38176 (169.81)	2.78 (4.48)	2113	7.82	0.467 (0.284)	15.08 (2.97)	177 (81)	47 (8)	29.22 (98.95)
3rd Gear									
301.26 (224.65)	37254 (165.71)	3.03 (4.88)	2071	7.57	0.450 (0.274)	15.67 (3.09)	182 (83)	49 (9)	29.22 (98.95)
4th Gear									
315.03 (234.92)	36116 (160.65)	3.27 (5.26)	1980	6.72	0.441 (0.268)	15.96 (3.14)	183 (84)	52 (11)	29.21 (98.92)
5th Gear									
324.72 (242.15)	35938 (159.86)	3.39 (5.45)	1860	6.64	0.436 (0.265)	16.15 (3.18)	184 (84)	54 (12)	29.20 (98.88)
6th Gear									
334.39 (249.35)	33755 (150.15)	3.71 (5.98)	1803	5.33	0.435 (0.265)	16.19 (3.19)	184 (84)	59 (15)	28.95 (98.04)
7th Gear									
341.32 (254.52)	30711 (136.61)	4.17 (6.71)	1805	4.17	0.426 (0.259)	16.53 (3.26)	186 (85)	58 (14)	28.95 (98.04)
8th Gear									
343.01 (255.79)	27438 (122.05)	4.69 (7.54)	1802	3.44	0.427 (0.260)	16.49 (3.25)	185 (85)	56 (13)	28.94 (98.00)
9th Gear									
341.87 (254.93)	24707 (109.90)	5.19 (8.35)	1802	3.07	0.428 (0.260)	16.46 (3.24)	187 (86)	57 (14)	28.94 (98.00)
10th Gear									
338.56 (252.46)	21835 (97.12)	5.81 (9.36)	1802	2.70	0.433 (0.264)	16.25 (3.20)	186 (85)	52 (11)	28.93 (97.97)
11th Gear									
337.71 (251.83)	19613 (87.24)	6.46 (10.39)	1802	2.33	0.432 (0.263)	16.30 (3.21)	186 (85)	52 (11)	28.93 (97.97)
12th Gear									
339.44 (253.12)	17804 (79.20)	7.15 (11.51)	1803	2.04	0.433 (0.263)	16.28 (3.21)	187 (86)	53 (12)	28.94 (98.00)
13th Gear									
332.40 (247.87)	15599 (69.39)	7.99 (12.86)	1806	1.95	0.437 (0.266)	16.14 (3.18)	186 (86)	58 (14)	28.95 (98.04)
14th Gear									
335.07 (249.86)	14255 (63.41)	8.81 (14.19)	1801	1.76	0.440 (0.268)	16.00 (3.15)	187 (86)	59 (15)	28.95 (98.04)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III, IV

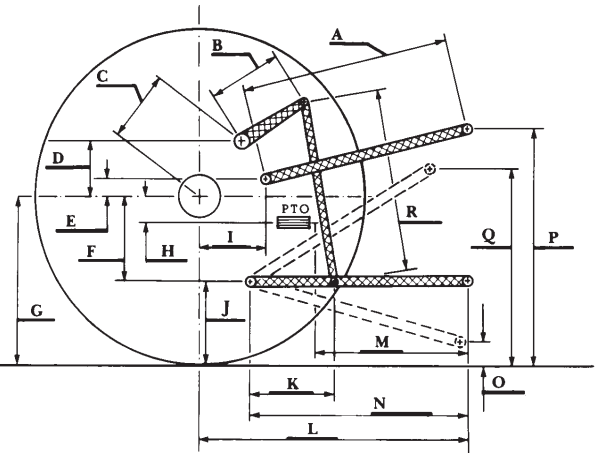
Quick Attach: yes

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: 2900 psi (200 bar)
Single outlet set Two outlet sets combined

Pump delivery rate at minimum pressure and rated engine speed: 33.9 GPM (128.3 l/min) 49.1 GPM (185.9 l/min)

iii) Pump delivery rate at maximum hydraulic power: 30.1 GPM (113.9 l/min) 46.2 GPM (174.9 l/min)
 Delivery pressure: 2055 psi (142 bar) 2100 psi (145 bar)
 Power: 36.0 HP (26.9 kW) 56.6 HP (42.2 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

HITCH DIMENSIONS AS TESTED—NO LOAD

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)

	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 9320 DIESEL

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