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January 2002

## Test 1804: John Deere 9320T 18 Speed

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 1804-SUMMARY 370

## JOHN DEERE 9320T DIESEL

### 18 SPEED

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/lr (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>Rated Engine Speed (PTO speed 1108 rpm)</b>					
333.14 (248.42)	2100	19.66 (74.43)	0.416 (0.253)	16.94 (3.34)	
<b>Standard Power Take-off Speed (PTO speed 1000 rpm)</b>					
358.95 (267.67)	1895	20.30 (76.84)	0.398 (0.242)	17.68 (3.48)	
<b>Maximum Power (2 hours)</b>					
389.14 (290.18)	1700	22.15 (83.85)	0.401 (0.244)	17.57 (3.46)	

#### VARYING POWER AND FUEL CONSUMPTION

333.14 (248.42)	2101	19.66 (74.43)	0.416 (0.253)	16.94 (3.34)	Air temperature
290.63 (216.72)	2155	18.06 (68.38)	0.438 (0.266)	16.09 (3.17)	75°F(24°C)
220.03 (164.07)	2173	15.34 (58.06)	0.491 (0.299)	14.35 (2.83)	Relative humidity
147.34 (109.87)	2189	12.52 (47.41)	0.599 (0.364)	11.76 (2.32)	18%
74.04 (55.21)	2211	9.33 (35.32)	0.887 (0.540)	7.94 (1.56)	Barometer
1.12 (0.84)	2234	5.71 (21.61)	35.816 (21.786)	0.20 (0.04)	29.25" Hg(99.05kPa)

Maximum Torque - 1291 lb.-ft. (1750 Nm) at 1102 rpm

Maximum Torque Rise - 55.0%

Torque rise at 1700 engine rpm - 44%

#### 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>									
305.74 (227.99)	26599 (118.32)	4.31 (6.94)	2099	2.87	0.453 (0.276)	15.53 (3.06)	188 (86)	57 (14)	29.12 (98.61)
<b>75% of Pull at Maximum Power 7th Gear</b>									
240.68 (179.47)	20039 (89.14)	4.50 (7.25)	2164	1.64	0.507 (0.308)	13.89 (2.74)	188 (87)	72 (22)	28.85 (97.70)
<b>50% of Pull at Maximum Power 7th Gear</b>									
162.78 (121.39)	13323 (59.26)	4.58 (7.37)	2185	0.93	0.597 (0.363)	11.79 (2.32)	184 (84)	73 (23)	28.81 (97.56)
<b>75% of Pull at Reduced Engine Speed 9th Gear</b>									
240.17 (179.10)	20022 (89.06)	4.50 (7.24)	1756	1.64	0.472 (0.287)	14.93 (2.94)	187 (86)	72 (22)	28.82 (97.60)
<b>50% of Pull at Reduced Engine Speed 9th Gear</b>									
163.49 (121.91)	13360 (59.43)	4.59 (7.39)	1778	0.93	0.522 (0.317)	13.50 (2.66)	180 (82)	73 (23)	28.83 (97.63)

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

**Dates of Test:** April 5 - May 31, 2002

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

**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 and hydraulic lubricant John Deere Hy-Gard fluid Total time engine was operated: 36.5 hours

**ENGINE: Make** John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** \*RG6125H032116\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.00" x 6.50"(127.0 mm x 165.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 765 cu in (12535 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** one paper element and water separator **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 21.6 psi (149 kPa)

**CHASSIS: Type** tracklayer-rubber tracked **Serial No.** \*RW9320T901024\* **Track width** 106.0"(2692 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 2.13 (3.42) second 2.62 (4.21) third 2.90 (4.66) fourth 3.24 (5.21) fifth 3.57 (5.74) sixth 3.98 (6.41) seventh 4.41 (7.10) eighth 4.93 (7.93) ninth 5.43 (8.74) tenth 6.06 (9.76) eleventh 6.71 (10.80) twelfth 7.42 (11.94) thirteenth 8.26 (13.29) fourteenth 9.13 (14.69) fifteenth 11.29 (18.17) sixteenth 13.89 (22.35) seventeenth 17.17 (27.63) eighteenth 21.13 (34.01) reverse 2.13 (3.42), 2.90 (4.66), 3.24 (5.21), 4.41, (7.10), 4.93 (7.93), 6.71 (10.80) **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** 42840 lb (19432 kg)

**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) Hp.hr/gal (kW.h/l)	cool- ing med	Barom. Air dry bulb	inch Hg (kPa)
1st Gear									
210.32 (156.83)	41342 (183.90)	1.91 (3.07)	2167	13.71	0.567 (0.345)	12.43 (2.45)	181 (83)	51 (11)	29.11 (98.58)
2nd Gear									
251.81 (187.77)	40289 (179.21)	2.34 (3.77)	2151	13.23	0.532 (0.323)	13.24 (2.61)	184 (84)	60 (16)	29.02 (98.27)
3rd Gear									
269.73 (201.14)	39229 (174.50)	2.58 (4.15)	2123	12.67	0.515 (0.313)	13.66 (2.69)	190 (88)	64 (18)	29.00 (98.21)
4th Gear									
284.72 (212.31)	35435 (157.62)	3.01 (4.85)	2100	7.52	0.492 (0.299)	14.32 (2.82)	185 (85)	66 (19)	28.96 (98.07)
5th Gear									
292.96 (218.46)	32353 (143.91)	3.40 (5.46)	2100	5.47	0.477 (0.290)	14.77 (2.91)	185 (85)	67 (19)	28.93 (97.97)
6th Gear									
299.28 (223.17)	29106 (129.47)	3.86 (6.21)	2101	3.85	0.466 (0.283)	15.11 (2.98)	186 (86)	59 (15)	29.12 (98.62)
7th Gear									
305.74 (227.99)	26599 (118.32)	4.31 (6.94)	2099	2.87	0.453 (0.276)	15.53 (3.06)	188 (86)	57 (14)	29.12 (98.62)
8th Gear									
304.72 (227.23)	23552 (104.76)	4.85 (7.81)	2098	2.03	0.460 (0.280)	15.31 (3.02)	189 (87)	55 (13)	29.13 (98.65)
9th Gear									
302.28 (225.41)	21096 (93.84)	5.37 (8.65)	2097	1.56	0.463 (0.281)	15.22 (3.00)	187 (86)	52 (11)	29.13 (98.65)
10th Gear									
298.85 (222.85)	18598 (82.73)	6.03 (9.70)	2100	1.40	0.473 (0.288)	14.90 (2.93)	186 (86)	51 (11)	29.12 (98.62)
11th Gear									
296.54 (221.13)	16631 (73.98)	6.69 (10.76)	2100	1.07	0.469 (0.285)	15.01 (2.96)	185 (85)	48 (9)	29.12 (98.62)
12th Gear									
291.34 (217.26)	14785 (65.77)	7.39 (11.89)	2098	1.01	0.483 (0.294)	14.57 (2.87)	184 (84)	59 (15)	29.11 (98.58)
13th Gear									
286.58 (213.70)	13065 (58.11)	8.23 (13.24)	2098	0.85	0.490 (0.298)	14.39 (2.83)	190 (88)	60 (16)	29.11 (98.58)

**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 102°F(39°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. **1804**, Nebraska Summary 370, 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 7th gear	76.5
Transport speed-no load- 18th gear	77.2
Bystander in 18th gear	92.7

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Track width</b>	30.0 in (760 mm)	30.0 in (760 mm)
<b>Ballast</b> - Cast iron(front)	3045 lb(1381 kg)	None
- Cast iron (side)	None	None
<b>Height of Drawbar</b>	19.0 in (485 mm)	19.0 in (485 mm)
<b>Static Weight with operator</b>	46060 lb(20892 kg)	43015 lb(19511 kg)

**DRAWBAR PERFORMANCE**  
**(Unballasted at 1700 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.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb (kPa)	Barom. inch Hg (kPa)
1st Gear									
213.55 (159.24)	41473 (184.48)	1.93 (3.11)	2165	12.55	0.560 (0.340)	12.59 (2.48)	181 (83)	51 (11)	29.11 (98.58)
2nd Gear									
250.22 (186.59)	40185 (178.75)	2.34 (3.76)	2153	13.65	0.538 (0.327)	13.10 (2.58)	185 (85)	60 (16)	29.02 (98.27)
3rd Gear									
271.34 (202.34)	39637 (176.31)	2.57 (4.13)	2122	13.04	0.511 (0.311)	13.79 (2.72)	189 (87)	64 (18)	29.00 (98.21)
4th Gear									
287.13 (214.11)	38485 (171.19)	2.80 (4.50)	2041	11.74	0.508 (0.309)	13.87 (2.73)	186 (85)	65 (18)	28.98 (98.14)
5th Gear									
297.83 (222.09)	36981 (164.50)	3.02 (4.86)	1973	10.53	0.489 (0.298)	14.39 (2.83)	187 (86)	68 (20)	28.90 (97.87)
6th Gear									
307.86 (229.57)	36533 (162.51)	3.16 (5.09)	1835	9.87	0.479 (0.291)	14.72 (2.90)	190 (88)	69 (21)	28.88 (97.80)
7th Gear									
326.67 (243.60)	36823 (163.79)	3.33 (5.36)	1723	8.68	0.470 (0.286)	14.97 (2.95)	185 (85)	58 (14)	29.12 (98.61)
8th Gear									
339.64 (253.27)	33142 (147.42)	3.84 (6.19)	1720	5.33	0.455 (0.277)	15.47 (3.05)	187 (86)	57 (14)	29.12 (98.61)
9th Gear									
343.13 (255.87)	30194 (134.31)	4.26 (6.86)	1704	3.93	0.453 (0.276)	15.54 (3.06)	186 (86)	53 (12)	29.13 (98.65)
10th Gear									
345.62 (257.73)	27006 (120.13)	4.80 (7.72)	1700	2.87	0.448 (0.272)	15.72 (3.10)	190 (88)	51 (11)	29.12 (98.61)
11th Gear									
347.58 (259.19)	24298 (108.08)	5.36 (8.63)	1705	2.18	0.436 (0.265)	16.15 (3.18)	189 (87)	50 (10)	29.12 (98.61)
12th Gear									
344.89 (257.18)	21826 (97.09)	5.93 (9.54)	1698	1.87	0.449 (0.273)	15.68 (3.09)	188 (87)	60 (16)	29.11 (98.58)
13th Gear									
339.63 (253.26)	19211 (85.45)	6.63 (10.67)	1697	1.40	0.456 (0.277)	15.46 (3.05)	189 (87)	61 (16)	29.10 (98.54)
14th Gear									
343.58 (256.21)	17561 (78.12)	7.34 (11.81)	1698	1.17	0.454 (0.276)	15.50 (3.05)	193 (89)	62 (17)	29.10 (98.54)
15th Gear									
333.23 (248.49)	13640 (60.67)	9.16 (14.74)	1708	0.85	0.470 (0.286)	14.97 (2.95)	194 (90)	63 (17)	29.10 (98.54)

**DRAWBAR PERFORMANCE**  
**(Ballasted at 1700 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									
230.37 (171.79)	45560 (202.66)	1.90 (3.05)	2163	14.20	0.545 (0.332)	12.82 (2.53)	183 (84)	53 (12)	28.88 (97.80)
2nd Gear									
272.21 (202.99)	43883 (195.20)	2.33 (3.74)	2117	12.63	0.508 (0.309)	13.75 (2.71)	186 (85)	56 (13)	28.87 (97.77)
3rd Gear									
294.23 (219.41)	42713 (189.99)	2.58 (4.16)	2086	11.00	0.480 (0.292)	14.57 (2.87)	186 (86)	59 (15)	28.86 (97.73)
4th Gear									
303.90 (226.62)	41617 (185.12)	2.74 (4.41)	1963	10.16	0.475 (0.289)	14.72 (2.90)	186 (85)	59 (15)	28.85 (97.70)
5th Gear									
313.72 (233.94)	41350 (183.93)	2.85 (4.58)	1854	10.36	0.473 (0.287)	14.79 (2.91)	188 (87)	59 (15)	28.84 (97.66)
6th Gear									
334.83 (249.68)	38978 (173.38)	3.22 (5.18)	1811	6.98	0.460 (0.280)	15.32 (3.02)	188 (86)	52 (11)	29.01 (98.24)
7th Gear									
343.34 (256.03)	38107 (169.51)	3.38 (5.44)	1700	6.14	0.454 (0.276)	15.51 (3.06)	190 (88)	51 (11)	29.01 (98.24)
8th Gear									
350.59 (261.44)	34190 (152.08)	3.85 (6.19)	1697	4.24	0.443 (0.269)	15.90 (3.13)	189 (87)	50 (10)	29.00 (98.21)
9th Gear									
352.48 (262.84)	30759 (136.82)	4.30 (6.92)	1700	3.19	0.440 (0.267)	16.02 (3.16)	189 (87)	48 (9)	29.01 (98.24)
10th Gear									
352.21 (262.64)	27353 (121.67)	4.83 (7.77)	1697	2.27	0.439 (0.267)	16.03 (3.16)	190 (88)	49 (9)	29.00 (98.21)
11th Gear									
352.08 (262.55)	24469 (108.84)	5.40 (8.68)	1704	1.89	0.440 (0.268)	16.00 (3.15)	189 (87)	45 (7)	29.02 (98.27)
12th Gear									
351.59 (262.18)	22034 (98.01)	5.98 (9.63)	1706	1.42	0.442 (0.269)	15.93 (3.14)	192 (89)	47 (8)	29.01 (98.24)
13th Gear									
340.65 (254.02)	19178 (85.31)	6.66 (10.72)	1701	1.34	0.457 (0.278)	15.40 (3.03)	193 (89)	53 (12)	29.01 (98.24)
14th Gear									
341.33 (254.53)	17430 (77.53)	7.34 (11.82)	1695	1.18	0.457 (0.278)	15.43 (3.04)	194 (90)	55 (13)	29.02 (98.27)
15th Gear									
330.71 (246.61)	13601 (60.50)	9.12 (14.67)	1699	1.02	0.473 (0.288)	14.89 (2.93)	194 (90)	56 (13)	29.02 (98.27)

### THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III, IV

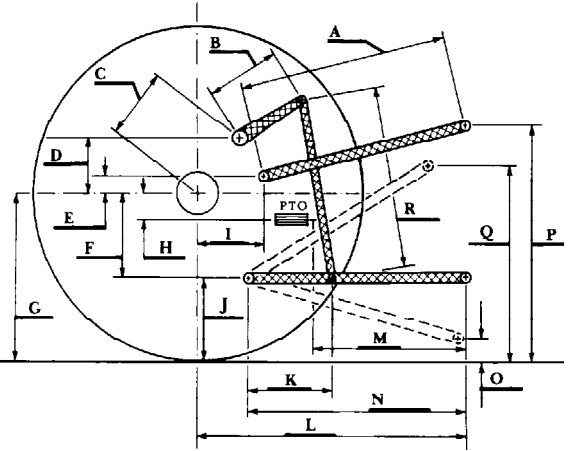
Quick Attach: yes

Maximum Force Exerted Through Whole Range: Category III 13605 lbs (60.5 kN) Category IV 14921 lbs (66.4 kN)  
 i) Opening pressure of relief valve: NA

Sustained pressure at compensator cutoff: 2970 psi (205 bar)  
**Single outlet set** **Two outlet sets combined**

ii) Pump delivery rate at minimum pressure and rated engine speed: 34.1 GPM (129.1 l/min) 51.5 GPM (194.9 l/min)

iii) Pump delivery rate at maximum hydraulic power: 31.9 GPM (120.8 l/min) 51.4 GPM (194.6 l/min)  
 Delivery pressure: 2155 psi (149 bar) 2204 psi (152 bar)  
 Power: 40.1 Hp (29.9 kW) 66.1 HP (49.3 kW)



### THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar): 2980 (205)  
 Location: lift cylinder  
 Hydraulic oil temperature: °F (°C): 145 (63)  
 Location: hydraulic valve  
 Category: III, IV  
 Quick attach: yes

HITCH DIMENSIONS AS TESTED NO LOAD

Category III (lift cylinders - 2x90 mm)					
SAE Static Test - System pressure 2680 psi (185 Bar)					
Hitch point distance to ground level in. (mm)	7.9 (201)	16.0 (407)	24.1 (613)	31.8 (807)	40.0 (1016)
Lift force on frame lb	14426	14737	14682	14307	13430
" " " " " " (kN)	(64.2)	(65.6)	(65.3)	(63.6)	(59.7)
ASAE Static Test - System pressure 2860 psi (197 Bar)					
Hitch point distance to ground level in. (mm)	7.9 (201)	16.0 (407)	24.1 (613)	31.8 (807)	40.0 (1016)
Lift force on frame lb	15373	15703	15643	15248	14312
" " " " " " (kN)	(68.4)	(69.9)	(69.6)	(67.8)	(63.7)
Category IV (lift cylinders - 1x90 mm & 1x100 mm)					
SAE Static Test - System pressure 2680 psi (185 Bar)					
Hitch point distance to ground level in. (mm)	9.0 (228)	15.2 (387)	22.3 (566)	29.6 (751)	36.8 (935)
Lift force on frame lb	15954	16238	16328	16020	15372
" " " " " " (kN)	(71.0)	(72.2)	(72.6)	(71.3)	(68.4)
ASAE Static Test - System pressure 2860 psi (197 Bar)					
Hitch point distance to ground level in. (mm)	9.0 (228)	15.2 (387)	22.3 (566)	29.6 (751)	36.8 (935)
Lift force on frame lb	17014	17317	17417	17094	16403
" " " " " " (kN)	(75.7)	(77.0)	(77.5)	(76.0)	(73.0)

	Category III		Category IV	
	inch	mm	inch	mm
A	30.8	783	30.0	762
B	18.5	471	18.5	471
C	31.9	810	31.9	810
D	30.4	772	30.4	772
E	11.3	288	11.3	288
F	13.8	350	13.8	350
G	32.9	836	32.9	836
H	0.7	19	0.7	19
I	22.7	577	22.7	577
J	19.1	486	19.1	486
K	29.4	746	29.4	746
L	54.4	1383	54.4	1383
*L'	61.0	1550	61.4	1560
M	24.5	623	24.5	623
N	43.1	1095	43.1	1095
O	8.0	203	9.0	229
P	49.6	1260	49.6	1260
Q	39.5	1003	40.5	1029
R	48.7	1238	47.9	1216

\*L' to Quick Attach ends



JOHN DEERE 9320T DIESEL

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