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Test 1802: John Deere 8520T 16 Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1802-SUMMARY 368

JOHN DEERE 8520T DIESEL

16 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 1009 rpm)					
255.96 (190.87)	2200	14.89 (56.36)	0.410 (0.249)	17.19 (3.39)	
Maximum Power (2 hours)					
291.67 (217.50)	2000	16.02 (60.65)	0.387 (0.235)	18.20 (3.59)	
VARYING POWER AND FUEL CONSUMPTION					
255.96 (190.87)	2200	14.89 (56.36)	0.410 (0.249)	17.19 (3.39)	Air temperature
223.39 (166.58)	2260	13.46 (50.94)	0.424 (0.258)	16.60 (3.27)	76°F (25°C)
168.38 (125.56)	2270	10.90 (41.27)	0.456 (0.277)	15.45 (3.04)	Relative humidity
112.52 (83.91)	2282	8.05 (30.47)	0.504 (0.307)	13.98 (2.75)	41%
56.58 (42.20)	2293	5.20 (19.67)	0.647 (0.393)	10.89 (2.15)	Barometer
1.01 (0.75)	2302	3.02 (11.44)	21.188 (12.888)	0.33 (0.07)	28.70" Hg (97.19 kPa)
Maximum Torque - 912 lb.-ft. (1236 Nm) at 1400 rpm					
Maximum Torque Rise - 49.2%					
Torque rise at 1800 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 cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power 9th Gear									
219.23 (163.48)	18432 (81.99)	4.46 (7.18)	2201	3.39	0.480 (0.292)	14.67 (2.89)	200 (93)	58 (14)	29.04 (98.34)
75% of Pull at Maximum Power 9th Gear									
172.15 (128.37)	13849 (61.60)	4.66 (7.50)	2264	1.87	0.518 (0.315)	13.61 (2.68)	202 (94)	59 (15)	29.04 (98.34)
50% of Pull at Maximum Power 9th Gear									
116.30 (86.72)	9224 (41.03)	4.73 (7.61)	2276	1.01	0.595 (0.362)	11.85 (2.33)	201 (94)	61 (16)	29.03 (98.31)
75% of Pull at Reduced Engine Speed 11th Gear									
172.94 (128.96)	13862 (61.66)	4.68 (7.53)	1697	1.87	0.434 (0.264)	16.22 (3.20)	206 (96)	60 (16)	29.05 (98.37)
50% of Pull at Reduced Engine Speed 11th Gear									
116.72 (87.04)	9231 (41.06)	4.74 (7.63)	1705	0.93	0.474 (0.288)	14.86 (2.93)	199 (93)	62 (17)	29.03 (98.31)

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

Dates of Test: April 30 - 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) 0.8457 Fuel weight 7.042 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: 29.0 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** *RG6081H203324* **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.56" x 5.06" (115.8 mm x 128.5 mm) **Compression ratio** 16.5 to 1 **Displacement** 496 cu in (8134 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 and transmission oil **Fuel filter** one paper element and water separator **Fuel cooler** radiator for pump inlet fuel **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 99.7 - 107.1 lb/h (45.2 - 48.6 kg/h) **High idle:** 2275 - 2325 rpm **Turbo boost:** nominal 26.8 - 29.7 psi (185 - 205 kPa) as measured 28.8 psi (199 kPa)

CHASSIS: Type tracklayer-rubber tracked **Serial No.** *RW8520T901146* **Track width** 88.0" (2235 mm) to 119.5 (3035 mm) **Length of track on ground** 89.0" (2261 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 0.96 (1.55) second 1.29 (2.08) third 1.72 (2.77) fourth 2.31 (3.71) fifth 2.58 (4.16) sixth 2.99 (4.80) seventh 3.46 (5.57) eighth 3.99 (6.42) ninth 4.61 (7.42) tenth 5.31 (8.55) eleventh 6.18 (9.94) twelfth 7.12 (11.46) thirteenth 8.39 (13.50) fourteenth 11.24 (18.09) fifteenth 14.96 (24.08) sixteenth 19.11 (30.78) reverse 0.90 (1.45), 2.42 (3.89), 3.04 (4.89), 5.35 (8.61) @1500 engine rpm **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 2179 engine rpm **Unladen tractor mass** 27280 lb (12374 kg)

DRAWBAR PERFORMANCE

Unballasted at 2200 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	Barom. inch Hg (kPa)
5th Gear									
172.29 (128.47)	27960 (124.37)	2.31 (3.72)	2260	13.10	0.557 (0.339)	12.64 (2.49)	201 (94)	52 (11)	29.02 (98.27)
6th Gear									
195.46 (145.75)	27112 (120.60)	2.70 (4.35)	2255	11.56	0.532 (0.323)	13.25 (2.61)	202 (94)	53 (12)	29.02 (98.27)
7th Gear									
210.98 (157.33)	24800 (110.31)	3.19 (5.13)	2201	7.96	0.501 (0.305)	14.05 (2.77)	201 (94)	55 (13)	29.03 (99.31)
8th Gear									
218.03 (162.58)	21559 (95.90)	3.79 (6.10)	2199	4.94	0.483 (0.294)	14.58 (2.87)	200 (93)	57 (14)	29.03 (99.31)
9th Gear									
219.23 (163.48)	18432 (81.99)	4.46 (7.18)	2201	3.39	0.480 (0.292)	14.67 (2.89)	200 (93)	58 (14)	29.04 (99.34)
10th Gear									
221.22 (164.97)	15949 (70.94)	5.20 (8.37)	2198	1.94	0.479 (0.291)	14.70 (2.90)	201 (94)	65 (18)	28.45 (96.34)
11th Gear									
218.65 (163.04)	13480 (59.96)	6.08 (9.79)	2198	1.40	0.486 (0.296)	14.49 (2.85)	200 (93)	65 (18)	28.45 (96.34)
12th Gear									
216.06 (161.12)	11504 (51.17)	7.04 (11.34)	2200	1.09	0.487 (0.296)	14.46 (2.85)	201 (94)	67 (19)	28.45 (96.34)
13th Gear									
213.06 (158.88)	9610 (42.75)	8.31 (13.38)	2198	0.85	0.494 (0.301)	14.25 (2.81)	201 (94)	70 (21)	28.48 (96.34)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE: The John Deere 8520T tractor is equipped with an electronic engine performance system that provides the following power levels:
 1. In gears 1-9 when the three point hitch rockshaft is lowered below the transport lock position, and the PTO is off - 248 PTO Hp (185 kW).
 2. All other conditions - 255 PTO Hp (190 kW).

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. **1802**, Nebraska Summary 368, July 23, 2002.

Brent T. Sampson
 Test Engineer

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

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 9th gear	75.0
Transport speed - no load - 16th gear	76.3
Bystander in 16th Gear	87.1

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Track width	30.0 in (760 mm)	30.0 in (760 mm)
Ballast - Cast iron(front)	3440 lb (1560 kg)	None
Height of Drawbar	17.0 in (430 mm)	17.0 in (430 mm)
Static Weight with operator	30895 lb(14014 kg)	27455 lb(12453 kg)

DRAWBAR PERFORMANCE
(Unballasted at 2000 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)
5th Gear									
175.12 (130.59)	28249 (125.66)	2.32 (3.74)	2260	12.49	0.551 (0.335)	12.79 (2.52)	199 (93)	52 (11)	29.02 (98.27)
6th Gear									
196.29 (146.38)	27062 (120.38)	2.72 (4.38)	2255	11.05	0.529 (0.322)	13.32 (2.62)	202 (94)	53 (12)	29.02 (98.27)
7th Gear									
211.57 (157.77)	24873 (110.64)	3.19 (5.13)	2200	8.03	0.500 (0.304)	14.09 (2.78)	201 (94)	55 (13)	29.03 (98.34)
8th Gear									
226.40 (168.83)	25601 (113.88)	3.32 (5.34)	2054	11.05	0.492 (0.299)	14.32 (2.82)	200 (93)	58 (14)	29.04 (98.31)
9th Gear									
242.53 (180.85)	23324 (103.75)	3.90 (6.28)	1999	6.93	0.465 (0.283)	15.14 (2.98)	201 (94)	59 (15)	29.04 (98.31)
10th Gear									
248.95 (185.64)	20053 (89.20)	4.66 (7.49)	2001	3.76	0.453 (0.276)	15.54 (3.06)	201 (94)	65 (18)	28.45 (96.34)
11th Gear									
250.35 (186.69)	17100 (76.06)	5.49 (8.84)	2003	2.40	0.450 (0.274)	15.64 (3.08)	202 (94)	65 (18)	28.45 (96.34)
12th Gear									
250.30 (186.65)	14761 (65.66)	6.36 (10.23)	2000	1.79	0.449 (0.273)	15.68 (3.09)	204 (96)	68 (20)	28.46 (96.38)
13th Gear									
247.40 (184.49)	12339 (54.88)	7.52 (12.10)	1996	1.32	0.451 (0.274)	15.62 (3.08)	203 (95)	71 (22)	28.50 (96.51)

DRAWBAR PERFORMANCE
(Ballasted at 2000 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)
4th Gear									
182.38 (136.00)	33031 (146.93)	2.07 (3.33)	2256	12.69	0.555 (0.338)	12.69 (2.50)	200 (93)	54 (12)	28.91 (97.91)
5th Gear									
199.87 (149.05)	31460 (139.94)	2.38 (3.83)	2242	9.84	0.521 (0.317)	13.52 (2.66)	202 (94)	54 (12)	28.92 (97.93)
6th Gear									
216.01 (161.08)	30426 (135.34)	2.66 (4.28)	2143	8.58	0.497 (0.302)	14.17 (2.79)	201 (94)	55 (13)	28.93 (97.97)
7th Gear									
227.48 (169.63)	27749 (123.43)	3.07 (4.95)	2108	7.69	0.486 (0.296)	14.50 (2.86)	199 (93)	69 (21)	28.85 (97.70)
8th Gear									
240.76 (179.54)	26614 (118.38)	3.39 (5.46)	2002	6.93	0.468 (0.285)	15.05 (2.97)	199 (93)	71 (22)	28.85 (97.70)
9th Gear									
246.12 (183.53)	22999 (102.30)	4.01 (6.46)	1998	4.57	0.460 (0.280)	15.32 (3.02)	201 (94)	73 (23)	28.85 (97.70)
10th Gear									
255.31 (190.38)	20272 (90.17)	4.72 (7.60)	1999	2.47	0.441 (0.268)	15.99 (3.15)	202 (94)	56 (13)	28.98 (98.14)
11th Gear									
252.69 (188.43)	17141 (76.25)	5.53 (8.90)	1998	1.78	0.446 (0.271)	15.80 (3.11)	204 (95)	57 (14)	29.00 (98.21)
12th Gear									
249.75 (186.24)	14611 (64.99)	6.41 (10.32)	2001	1.46	0.447 (0.272)	15.75 (3.10)	204 (96)	57 (14)	29.02 (98.27)
13th Gear									
246.64 (183.92)	12210 (54.31)	7.57 (12.19)	2001	0.99	0.454 (0.276)	15.52 (3.06)	204 (96)	58 (14)	29.04 (98.34)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III

Quick Attach: yes

Maximum Force Exerted Through Whole Range: 16520 lbs (73.5 kN)

i) Opening pressure of relief valve: NA

Sustained pressure at compensator cutoff:	2940 psi (203 bar)	<u>High flow option</u> 2930 psi (202 bar)
	two outlet sets combined	

ii) Pump delivery rate at minimum pressure and rated engine speed:	34.6 GPM (131.0 l/min)	43.3 GPM (163.9 l/min)
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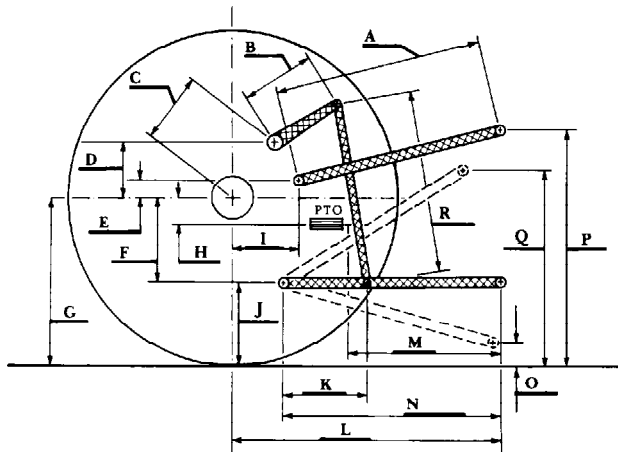
iii) Pump delivery rate at maximum hydraulic power:	34.2 GPM (129.5 l/min)	42.7 GPM (161.6 l/min)
Delivery pressure:	2490 psi (172 bar)	2295 psi (158 bar)
Power:	49.7 HP (37.1 kW)	57.2 HP (42.7 kW)

single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed:	33.1 GPM (125.3 l/min)	34.2 GPM (129.5 l/min)
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iii) Pump delivery rate at maximum hydraulic power:	31.6 GPM (119.6 l/min)	30.8 GPM (116.6 l/min)
Delivery pressure:	2150 psi (148 bar)	2090 psi (144 bar)
Power:	39.6 HP (29.5 kW)	37.6 HP (28.0 kW)

HITCH DIMENSIONS AS TESTED NO LOAD



	inch	mm
A	29.5	750
B	20.5	520
C	22.9	582
D	22.2	565
E	10.2	260
F	11.0	280
G	33.5	851
H	3.1	79
I	15.6	395
J	22.5	571
K	28.9	733
L	49.9	1268
*L'	53.4	1357
M	25.5	647
N	42.6	1082
O	9.0	230
P	40.8	1037
Q	38.7	983
R	45.1	1146

*L' to Quick Attach ends



JOHN DEERE 8520T DIESEL

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