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January 2003

Test 1819: John Deere 8120 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1819—SUMMARY 396

JOHN DEERE 8120 DIESEL

16 SPEED

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

Dates of Test: March 28 - April 8, 2003

Manufacturer: John Deere Waterloo Works, P.O.
Box 270, Waterloo Ia, USA 50704

FUEL, OIL and TIME: Fuel No. 2 Diesel
Specific gravity converted to 60°/60°F (15°/15°C)
0.8400 **Fuel weight** 6.994 lbs/gal (0.838 kg/l) **Oil**
SAE 15W-40 **API service classification** CF-4
Transmission and hydraulic lubricant John
Deere Hy-Gard fluid **Front axle lubricant** SAE
85W-140 **API GL-5 Total time engine was**
operated: 21.5 hours

ENGINE: Make John Deere **Diesel Type** six
cylinder vertical with turbocharger and air to air
aftercooler **Serial No.** *RG6081H217953*
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 prestrainer **Fuel cooler** radiator for pump
inlet fuel **Muffler** vertical **Cooling medium**
temperature control 2 thermostats and variable
speed fan

ENGINE OPERATING PARAMETERS: Fuel
rate: 68.3 - 75.8 lb/h (31.0 - 34.4 kg/h) **High idle:**
2275 - 2325 rpm **Turbo boost:** nominal 16.0 - 20.3
psi (110 - 140 kPa) as measured 19.4 psi (134 kPa)

CHASSIS: Type front wheel assist **Serial**
No. *RW8120P11518* **Tread width** rear 60.0"
(1524 mm) to 130.6 (3318 mm) front 60.0" (1523
mm) to 88.0" (2234 mm) **Wheelbase** 116.9" (2970
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 1.19 (1.91) second
1.59 (2.56) third 2.11 (3.40) fourth 2.84 (4.57) fifth
3.18 (5.12) sixth 3.67 (5.90) seventh 4.26 (6.85)
eighth 4.92 (7.91) ninth 5.67 (9.12) tenth 6.54
(10.52) eleventh 7.59 (12.22) twelfth 8.76 (14.09)
thirteenth 10.32 (16.61) fourteenth 13.82 (22.24)
fifteenth 18.40 (29.61) sixteenth 24.03 (38.67)
reverse 1.11 (1.79), 2.98 (4.79), 3.74 (6.02), 6.58
(10.59) @ 1500 engine rpm **Clutch** wet multiple
disc hydraulically actuated by foot pedal **Brakes** wet
multiple disc hydraulically operated by two foot
pedals that can be locked together **Steering**
hydrostatic **Power take-off** 1 3/4" shaft -1000 rpm
at 2179 engine rpm, (optional - 1 3/8" shaft, 540 rpm
at 1978 engine rpm or 1000 rpm at 2179 engine
rpm) **Unladen tractor mass** 20060 lb (9099 kg)

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—1010 rpm)					
172.13 (128.36)	2201	10.11 (38.27)	0.411 (0.250)	17.03 (3.35)	
Maximum Power (2 hours)					
199.71 (148.93)	1900	10.49 (39.69)	0.367 (0.223)	19.05 (3.75)	

VARYING POWER AND FUEL CONSUMPTION

172.13 (128.36)	2201	10.11 (38.27)	0.411 (0.250)	17.03 (3.35)	Air temperature
149.91 (111.79)	2257	9.22 (34.91)	0.430 (0.262)	16.26 (3.20)	76°F (24°C)
112.87 (84.17)	2267	7.68 (29.06)	0.476 (0.289)	14.70 (2.90)	Relative humidity
75.54 (56.33)	2275	6.05 (22.89)	0.560 (0.341)	12.49 (2.46)	31%
37.90 (28.26)	2286	4.42 (16.72)	0.815 (0.496)	8.58 (1.69)	Barometer
2.00 (1.50)	2295	2.96 (11.20)	10.325 (6.280)	0.68 (0.13)	28.84" Hg (97.66 kPa)

Maximum Torque - 632 lb.-ft. (857 Nm) at 1400 rpm

Maximum Torque Rise - 53.6%

Torque rise at 1800 engine rpm - 40%

DRAWBAR PERFORMANCE

UNBALLASTED - FRONT DRIVE ENGAGED

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—8th Gear									
148.45 (110.70)	11560 (51.42)	4.82 (7.73)	2200	3.96	0.480 (0.292)	14.58 (2.87)	187 (86)	68 (20)	28.74 (97.33)
75% of Pull at Maximum Power—8th Gear									
116.11 (86.59)	8704 (38.72)	5.00 (8.05)	2261	2.81	0.537 (0.327)	13.03 (2.57)	185 (85)	75 (24)	28.69 (97.16)
50% of Pull at Maximum Power—8th Gear									
78.55 (58.57)	5797 (25.78)	5.08 (8.18)	2271	1.75	0.635 (0.386)	11.01 (2.17)	181 (83)	76 (24)	28.68 (97.12)
75% of Pull at Reduced Engine Speed—10th Gear									
116.24 (86.68)	8686 (38.64)	5.02 (8.08)	1703	2.81	0.458 (0.279)	15.26 (3.01)	187 (86)	75 (24)	28.69 (97.16)
50% of Pull at Reduced Engine Speed—10th Gear									
78.50 (58.54)	5793 (25.77)	5.08 (8.18)	1706	1.81	0.513 (0.312)	13.64 (2.69)	181 (83)	77 (25)	28.67 (97.08)

DRAWBAR PERFORMANCE

UNBALLASTED - FRONT DRIVE ENGAGED (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)	Temp. °F (°C) cool- ing med	Barom. inch Hg (kPa)		
4th Gear									
127.50 (95.08)	18768 (83.48)	2.55 (4.10)	2255	14.07	0.554 (0.337)	12.63 (2.49)	181 (83)	56 (13)	28.52 (96.58)
5th Gear									
139.11 (103.74)	17824 (79.29)	2.93 (4.71)	2240	11.47	0.520 (0.316)	13.45 (2.65)	183 (84)	61 (16)	28.51 (96.55)
6th Gear									
146.54 (109.27)	15962 (71.00)	3.44 (5.54)	2196	7.67	0.489 (0.297)	14.31 (2.82)	185 (85)	68 (20)	28.51 (96.55)
7th Gear									
147.19 (109.76)	13389 (59.56)	4.12 (6.63)	2199	5.09	0.487 (0.296)	14.38 (2.83)	186 (85)	72 (22)	28.72 (97.26)
8th Gear									
148.45 (110.70)	11560 (51.42)	4.82 (7.75)	2200	3.96	0.480 (0.292)	14.58 (2.87)	187 (86)	68 (20)	28.74 (97.33)
9th Gear									
148.91 (111.04)	9972 (44.36)	5.60 (9.01)	2198	3.17	0.477 (0.290)	14.68 (2.89)	186 (85)	64 (18)	28.75 (97.36)
10th Gear									
147.21 (109.77)	8512 (37.86)	6.49 (10.44)	2195	2.54	0.482 (0.293)	14.52 (2.86)	184 (84)	55 (13)	28.79 (97.49)
11th Gear									
143.62 (107.10)	7107 (31.61)	7.58 (12.20)	2198	1.99	0.493 (0.300)	14.18 (2.79)	185 (85)	60 (16)	28.75 (97.36)
12th Gear									
140.31 (104.63)	6002 (26.70)	8.77 (14.11)	2197	1.81	0.508 (0.309)	13.77 (2.71)	184 (84)	61 (16)	28.75 (97.36)

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 96°F (36°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. **1819**, Nebraska Summary 396, June 26, 2003.

Leonard L. Bashford
Director

M.F. Kocher
W.P. Campbell
G.J. Hoffman
Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 8th gear	71.9	71.8
Transport speed - no load - 16th gear		74.3
Bystander in 16th Gear		84.8

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires - No., size, ply & psi(kPa)	Four 480/80R46;**,8(55)	Two 480/80R46;**,18(125)
Ballast - Duals (total)	1830 lb (830 kg)	None
- Cast Iron (total)	None	None
Front Tires - No., size, ply & psi(kPa)	Two 380/85R34;**,20(150)	Two 380/85R34;**,20(150)
Ballast - Liquid (total)	None	None
- Cast Iron (total)	330 lb (150 kg)	None
Height of Drawbar	22.5 in (560 mm)	23.0 in (585 mm)
Static Weight with operator - Rear	13795 lb (6258 kg)	12020 lb (5452 kg)
- Front	8600 lb (3900 kg)	8215 lb (3726 kg)
- Total	22395 lb (10158 kg)	20235 lb (9178 kg)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED(1900 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)
4th Gear									
127.84 (95.33)	18762 (83.46)	2.55 (4.11)	2255	13.85	0.551 (0.335)	12.70 (2.50)	180 (82)	56 (13)	28.52 (96.58)
5th Gear									
139.85 (104.29)	17949 (79.84)	2.92 (4.70)	2237	11.54	0.513 (0.312)	13.64 (2.69)	183 (84)	61 (16)	28.51 (96.55)
6th Gear									
146.41 (109.18)	16342 (72.69)	3.36 (5.41)	2168	8.87	0.491 (0.298)	14.25 (2.81)	186 (85)	69 (21)	28.52 (96.58)
7th Gear									
159.85 (119.20)	16390 (72.91)	3.66 (5.89)	2045	9.34	0.461 (0.281)	15.16 (2.99)	186 (86)	69 (21)	28.53 (96.61)
8th Gear									
169.22 (126.19)	15790 (70.24)	4.02 (6.47)	1901	7.18	0.434 (0.264)	16.12 (3.18)	190 (88)	74 (23)	28.70 (97.19)
9th Gear									
172.46 (128.60)	13678 (60.84)	4.73 (7.61)	1895	5.17	0.426 (0.259)	16.43 (3.24)	190 (88)	70 (21)	28.73 (97.29)
10th Gear									
173.41 (129.31)	11734 (52.19)	5.54 (8.92)	1902	3.96	0.427 (0.260)	16.38 (3.23)	189 (87)	66 (19)	28.74 (97.33)
11th Gear									
172.30 (128.48)	9946 (44.24)	6.50 (10.46)	1902	3.08	0.428 (0.260)	16.34 (3.22)	186 (86)	58 (14)	28.76 (97.39)
12th Gear									
170.36 (127.04)	8484 (37.74)	7.53 (12.12)	1903	2.54	0.434 (0.264)	16.11 (3.17)	187 (86)	56 (13)	28.78 (97.46)
13th Gear									
169.00 (126.02)	7127 (31.70)	8.89 (14.31)	1898	1.99	0.433 (0.264)	16.14 (3.18)	188 (86)	62 (17)	28.75 (97.36)

DRAWBAR PERFORMANCE
BALLASTED - FRONT DRIVE ENGAGED(1900 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)
3rd Gear									
111.93 (83.47)	22308 (99.23)	1.88 (3.03)	2260	14.62	0.584 (0.355)	11.98 (2.36)	180 (82)	59 (15)	28.42 (96.24)
4th Gear									
141.78 (105.73)	21339 (94.92)	2.49 (4.01)	2142	10.89	0.510 (0.310)	13.70 (2.70)	185 (85)	60 (16)	28.43 (96.28)
5th Gear									
154.89 (115.50)	20793 (92.49)	2.79 (4.50)	2101	9.21	0.475 (0.289)	14.72 (2.90)	185 (85)	62 (17)	28.43 (96.28)
6th Gear									
166.02 (123.80)	19757 (87.88)	3.15 (5.07)	2010	7.31	0.449 (0.273)	15.58 (3.07)	186 (85)	64 (18)	28.43 (96.28)
7th Gear									
170.76 (127.33)	18294 (81.37)	3.50 (5.63)	1899	6.16	0.434 (0.264)	16.11 (3.17)	190 (88)	66 (19)	28.44 (96.31)
8th Gear									
174.13 (129.85)	15859 (70.54)	4.12 (6.63)	1902	4.38	0.427 (0.260)	16.38 (3.23)	191 (88)	67 (19)	28.44 (96.31)
9th Gear									
173.58 (129.44)	13622 (60.59)	4.78 (7.69)	1897	3.59	0.426 (0.259)	16.42 (3.23)	193 (89)	68 (20)	28.44 (96.31)
10th Gear									
172.50 (128.64)	11659 (51.86)	5.55 (8.93)	1899	3.07	0.430 (0.261)	16.28 (3.21)	191 (88)	69 (21)	28.44 (96.31)
11th Gear									
169.68 (126.53)	9822 (43.69)	6.48 (10.43)	1899	2.62	0.435 (0.265)	16.06 (3.16)	194 (90)	69 (21)	28.44 (96.31)
12th Gear									
167.11 (124.61)	8342 (37.10)	7.51 (12.09)	1903	2.17	0.442 (0.269)	15.84 (3.12)	191 (88)	69 (21)	28.44 (96.31)
13th Gear									
164.06 (122.34)	6946 (30.90)	8.86 (14.26)	1898	1.81	0.450 (0.274)	15.53 (3.06)	193 (89)	70 (21)	28.44 (96.31)



THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III

Quick Attach: Yes

Maximum Force Exerted Through Whole Range:

lift cylinders
2 x 90 mm
12353 lbs (54.9 kN)

lift cylinders
2 x 100 mm
15387 lbs (68.4 kN)

i) Opening pressure of relief valve:

NA

NA

Sustained pressure at compensator cutoff:

2920 psi (201 bar)

2994 psi (206 bar)

two outlet sets combined

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

35.2 GPM (133.2 l/min)

43.6 GPM (165.0 l/min)

iii) Pump delivery rate at maximum hydraulic power:

33.2 GPM (125.7 l/min)

42.4 GPM (160.5 l/min)

Delivery pressure:

2700 psi (186 bar)

2504 psi (173 bar)

Power:

52.4 HP (39.1 kW)

61.9 HP (46.2 kW)

single outlet set

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

34.3 GPM (129.8 l/min)

40.1 GPM (151.8 l/min)

iii) Pump delivery rate at maximum hydraulic power:

32.9 GPM (124.5 l/min)

35.2 GPM (133.2 l/min)

Delivery pressure:

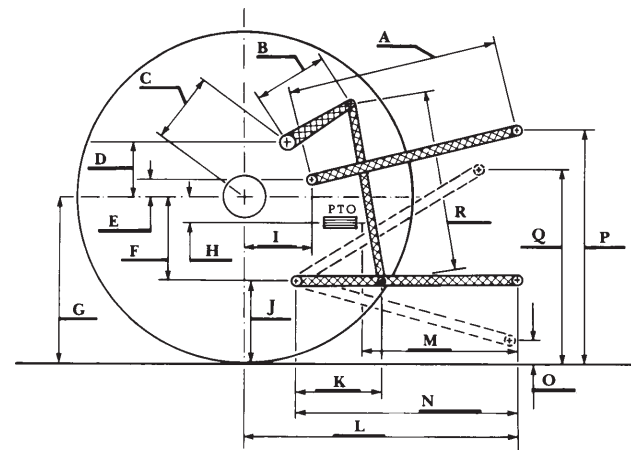
2090 psi (144 bar)

2155 psi (149 bar)

Power:

40.1 HP (29.9 kW)

44.3 HP (33.0 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.8	732
B	20.5	520
C	21.7	550
D	19.5	495
E	7.3	185
F	13.8	350
G	37.6	955
H	7.8	197
I	20.3	515
J	23.8	605
K	28.9	733
L	49.9	1268
*L'	53.4	1357
M	22.0	558
N	38.1	1082
O	9.0	230
P	42.6	1164
Q	39.2	995
R	45.3	1150

*L' to Quick Attach ends



JOHN DEERE 8120 DIESEL

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