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January 2000

Test 1786: John Deere 7510 Powrquad Diesel 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1786-SUMMARY 339

JOHN DEERE 7510 POWRQUAD DIESEL

16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	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					
115.07 (85.81)	2101	6.80 (25.75)	0.415 (0.252)	16.92 (3.33)	
118.81 (88.60)	1901	6.65 (25.16)	0.392 (0.239)	17.88 (3.52)	

VARYING POWER AND FUEL CONSUMPTION

115.07 (85.81)	2101	6.80 (25.75)	0.415 (0.252)	16.92 (3.33)	Air temperature
99.87 (74.48)	2151	6.20 (23.47)	0.436 (0.265)	16.11 (3.17)	75°F (24°C)
76.31 (56.91)	2179	5.22 (19.74)	0.480 (0.292)	14.63 (2.88)	Relative humidity
51.22 (38.20)	2209	4.15 (15.70)	0.568 (0.346)	12.35 (2.43)	78%
26.02 (19.41)	2245	2.86 (10.84)	0.772 (0.470)	9.09 (1.79)	Barometer
1.55 (1.15)	2265	1.97 (7.44)	8.931 (5.433)	0.79 (0.15)	29.07" Hg (98.44 kPa)

Maximum Torque - 395 lb.-ft. (535 Nm) at 1302 rpm

Maximum Torque Rise - 37.1%

Torque rise at 1705 engine rpm - 26%

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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
101.26 (75.51)	8409 (37.40)	4.52 (7.27)	2100	3.61	0.465 (0.283)	15.09 (2.97)	184 (84)	71 (22)	28.86 (97.73)
78.85 (58.80)	6307 (28.05)	4.69 (7.55)	2157	2.55	0.507 (0.309)	13.83 (2.72)	182 (83)	75 (24)	28.84 (97.66)
53.90 (40.19)	4201 (18.69)	4.81 (7.74)	2194	1.72	0.597 (0.363)	11.75 (2.31)	181 (83)	75 (24)	28.85 (97.70)
78.83 (58.78)	6302 (28.03)	4.69 (7.55)	1626	2.55	0.453 (0.276)	15.49 (3.05)	184 (84)	75 (24)	28.85 (97.70)
54.04 (40.30)	4200 (18.68)	4.83 (7.77)	1657	1.64	0.506 (0.308)	13.86 (2.73)	181 (83)	76 (24)	28.86 (97.73)

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

Dates of Test: October 23-November 29, 2000

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) 0.8427 Fuel weight 7.017 lbs/gal (0.841 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: 37.5 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *T06068T856910* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.19" x 5.00" (106.5 mm x 127.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 414 cu in (6788 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 **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 46.7 - 49.8 lb/h (21.2 - 22.6 kg/h) **High idle:** 2250 - 2300 rpm **Turbo boost:** nominal 7.7 - 12.0 psi (53 - 83 kPa) as measured 11.6 psi (80 kPa)

CHASSIS: Type front wheel assist **Serial No.** *RW7510H037961* **Tread width** rear 60.0" (1524 mm) to 108.3 (2752 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) **Wheelbase** 103.3" (2625 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (4) range operator controlled power shift **Nominal travel speeds mph (km/h)** first 1.49 (2.40) second 1.80 (2.89) third 2.16 (3.47) fourth 2.64 (4.25) fifth 3.17 (5.10) sixth 3.82 (6.14) seventh 4.57 (7.35) eighth 5.04 (8.11) ninth 5.59 (9.00) tenth 6.06 (9.76) eleventh 7.27 (11.70) twelfth 8.90 (14.33) thirteenth 10.45 (16.82) fourteenth 12.58 (20.25) fifteenth 15.07 (24.25) sixteenth 18.46 (29.71) reverse 1.77 (2.85), 2.13 (3.43), 2.55 (4.11), 3.13 (5.04), 3.75 (6.04), 4.52 (7.28), 5.42 (8.72), 5.98 (9.62), 6.64 (10.68), 7.20 (11.58), 8.62 (13.87), 10.56 (16.99), 12.39 (19.94), 14.93 (24.02), 17.87 (28.76), 21.90 (35.24) **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** 540 rpm at 2080 engine rpm or 1000 rpm at 2093 engine rpm **Unladen tractor mass** 13280 lb (6024 kg)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED
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	Air dry bulb	Barom. inch Hg (kPa)
4th(A4)Gear								
88.96 (66.34)	13818 (61.46)	2.41 (3.89)	2131	12.05	0.511 (0.311)	13.73 (2.70)	182 (83)	29.07 (98.44)
5th(B1)Gear								
101.69 (75.83)	13032 (57.97)	2.93 (4.71)	2061	8.13	0.464 (0.282)	15.14 (2.98)	185 (85)	29.09 (98.51)
6th(B2)Gear								
102.94 (76.76)	11596 (51.58)	3.33 (5.36)	1906	6.19	0.450 (0.274)	15.58 (3.07)	184 (84)	28.86 (97.73)
7th(B3)Gear								
103.88 (77.46)	9571 (42.57)	4.07 (6.55)	1907	4.17	0.447 (0.272)	15.70 (3.09)	185 (85)	28.86 (97.73)
8th(C1)Gear								
104.83 (78.17)	8732 (38.84)	4.50 (7.25)	1902	3.77	0.444 (0.270)	15.80 (3.11)	187 (86)	28.87 (97.77)
9th(B4)Gear								
106.09 (79.11)	7936 (35.30)	5.01 (8.07)	1899	3.12	0.440 (0.268)	15.95 (3.14)	184 (84)	28.85 (97.70)
10th(C2)Gear								
105.96 (79.02)	7273 (32.35)	5.46 (8.79)	1902	3.04	0.441 (0.268)	15.93 (3.14)	186 (85)	28.86 (97.73)
11th(C3)Gear								
105.76 (78.87)	6039 (26.86)	6.57 (10.57)	1897	2.47	0.443 (0.270)	15.83 (3.12)	187 (86)	28.87 (97.77)
12th(C4)Gear								
101.34 (75.57)	4700 (20.91)	8.09 (13.01)	1898	1.97	0.460 (0.280)	15.27 (3.01)	187 (86)	29.12 (98.61)

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 135°F(57°C). This tractor did not meet the manufacturer's claim of 40% torque rise. The pull in 4th(A4) gear(unballasted tractor) was limited to avoid excessive 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. **1786**, Nebraska Summary 339, December 14, 2000.

David L. Morgan
Assistant Director

L.L. Bashford
M.F. Kocher
R.D. Grisso, Jr.
Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 7th (B3) gear	72.7	72.7
Transport speed-no load- 16th(D4) gear		73.1
Bystander in 16th (D4) Gear		82.0

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires - No., size, ply & psi(kPa)	Two 18.4R38;*;16(110)	Two 18.4R38;*;14(95)
Ballast - Liquid (total)	None	None
- Cast Iron (total)	1000 lb (453 kg)	None
Front Tires - No., size, ply & psi(kPa)	Two 14.9R28;***;18(125)	Two 14.9R28;***;14(95)
Ballast - Liquid (total)	None	None
- Cast Iron (total)	1115 lb (506 kg)	None
Height of Drawbar	22.0 in (560 mm)	22.0 in (560 mm)
Static Weight with operator - Rear	9520 lb (4318 kg)	8730 lb (3960 kg)
- Front	6050 lb (2744 kg)	4725 lb (2143 kg)
- Total	15570 lb (7062 kg)	13455 lb (6103 kg)

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		Temp. °F(°C)		Barom. inch Hg (kPa)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med	Air dry bulb	
3rd(A3)Gear									
80.60 (60.10)	15628 (69.52)	1.93 (3.11)	2141	14.26	0.529 (0.322)	13.26 (2.61)	183 (84)	64 (18)	28.89 (97.83)
4th(A4)Gear									
96.73 (72.13)	14834 (65.98)	2.45 (3.94)	2098	9.77	0.488 (0.297)	14.39 (2.83)	184 (84)	66 (19)	28.89 (97.83)
5th(B1)Gear									
105.92 (78.99)	13702 (60.95)	2.90 (4.67)	1990	5.87	0.443 (0.270)	15.84 (3.12)	184 (84)	45 (7)	28.98 (98.14)
6th(B2) Gear									
107.66 (80.28)	11950 (53.15)	3.38 (5.44)	1901	4.54	0.433 (0.264)	16.19 (3.19)	187 (86)	47 (8)	28.98 (98.14)
7th(B3) Gear									
107.45 (80.12)	9841 (43.77)	4.09 (6.59)	1903	3.50	0.434 (0.264)	16.15 (3.18)	187 (86)	49 (9)	28.93 (97.97)
8th(C1)Gear									
105.52 (78.68)	8721 (38.79)	4.54 (7.30)	1903	3.10	0.439 (0.267)	16.00 (3.15)	187 (86)	49 (9)	28.94 (98.00)
9th(B4)Gear									
106.15 (79.16)	7879 (35.05)	5.05 (8.13)	1904	2.85	0.438 (0.266)	16.03 (3.16)	186 (86)	49 (9)	28.97 (98.10)
10th(C2)Gear									
105.54 (78.70)	7196 (32.01)	5.50 (8.85)	1905	2.61	0.437 (0.266)	16.06 (3.16)	189 (87)	44 (7)	28.98 (98.14)
11th(C3) Gear									
104.78 (78.13)	5938 (26.41)	6.62 (10.65)	1906	2.19	0.441 (0.268)	15.90 (3.13)	187 (86)	43 (6)	28.98 (98.14)
12th(C4)Gear									
102.16 (76.18)	4714 (20.97)	8.13 (13.08)	1903	1.78	0.456 (0.277)	15.38 (3.03)	187 (86)	42 (6)	28.99 (98.17)

DRAWBAR PERFORMANCE
BALLASTED - FRONT DRIVE ENGAGED (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)	Hp.hr/gal (kW/h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd (A3) Gear									
79.75 (59.47)	15507 (68.98)	1.93 (3.10)	2141	14.44	0.533 (0.324)	13.17 (2.59)	182 (83)	64 (18)	28.89 (97.83)
4th (A4) Gear									
97.02 (72.35)	14855 (66.08)	2.45 (3.94)	2101	9.63	0.487 (0.296)	14.42 (2.84)	182 (83)	66 (19)	28.89 (97.83)
5th (B1) Gear									
104.40 (77.85)	12683 (56.42)	3.09 (4.97)	2101	5.01	0.456 (0.277)	15.40 (3.03)	184 (84)	46 (8)	28.98 (98.14)
6th (B2) Gear									
105.27 (78.50)	10484 (46.63)	3.77 (6.06)	2104	3.83	0.452 (0.275)	15.53 (3.06)	186 (85)	49 (9)	28.98 (98.14)
7th (B3) Gear									
104.91 (78.23)	8647 (38.46)	4.55 (7.32)	2106	3.02	0.457 (0.278)	15.37 (3.03)	186 (86)	49 (9)	28.92 (97.93)
8th (C1) Gear									
103.14 (76.91)	7689 (34.20)	5.03 (8.10)	2101	2.69	0.460 (0.280)	15.25 (3.00)	188 (86)	49 (9)	28.94 (98.00)
9th (B4) Gear									
102.79 (76.65)	6891 (30.65)	5.59 (9.00)	2098	2.61	0.463 (0.282)	15.16 (2.99)	188 (86)	49 (9)	28.96 (98.07)
10th (C2) Gear									
102.70 (76.58)	6331 (28.16)	6.08 (9.79)	2100	2.28	0.460 (0.280)	15.24 (3.00)	188 (87)	45 (7)	28.98 (98.14)
11th (C3) Gear									
101.49 (75.68)	5197 (23.12)	7.32 (11.79)	2102	1.94	0.467 (0.284)	15.01 (2.96)	185 (85)	42 (6)	28.98 (98.14)
12th (C4) Gear									
97.88 (72.99)	4087 (18.18)	8.98 (14.45)	2097	1.61	0.486 (0.296)	14.43 (2.84)	187 (86)	41 (5)	28.99 (98.17)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: None

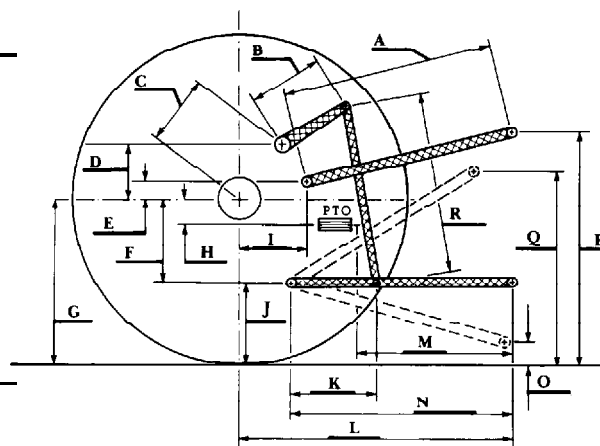
Maximum Force Exerted Through Whole Range: 7790 lbs (34.6 kN)

i) Opening pressure of relief valve: NA

Sustained pressure at compensator cutoff: 2880 psi (199 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 26.7 GPM (101.1 l/min)

iii) Pump delivery rate at maximum hydraulic power: 24.3 GPM (92.0 l/min)
 Delivery pressure: 2590 psi (179 bar)
 Power: 36.7 HP (27.4 kW)



THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar) 2950 (203)
 Location: lift cylinders
 Hydraulic oil temperature: °F (°C) 140 (60)
 Location: hydraulic sump
 Category: II
 Quick attach: No

SAE Static Test System pressure 2650 psi (182 Bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	15.0 (381)	22.0 (559)	29.0 (737)	36.0 (914)
Lift force on frame lb	11826	10773	10143	9405	8577
" " " " " (kN)	(52.6)	(47.9)	(45.1)	(41.8)	(38.2)

ASAE Static Test System pressure 2860 psi (197 Bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	15.0 (381)	22.0 (559)	29.0 (737)	36.0 (914)
Lift force on frame lb	12739	11605	10926	10131	9239
" " " " " (kN)	(56.7)	(51.6)	(48.6)	(45.1)	(41.1)

HITCH DIMENSIONS AS TESTED NO LOAD

	inch	mm
A	27.8	705
B	15.7	400
C	21.8	554
D	20.6	523
E	4.9	125
F	9.8	250
G	32.3	820
H	3.1	80
I	18.0	456
J	22.5	570
K	21.1	537
L	44.2	1122
M	19.8	502
N	37.9	962
O	8.0	203
P	46.5	1180
Q	35.9	911
R	35.0	889



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