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January 2002

## Test 1808: John Deere 6403 Diesel 9-Speed

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 1808—SUMMARY 374

## JOHN DEERE 6403 DIESEL

### 9 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
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed—(PTO speed—1016 rpm)</b>					
86.77 (64.70)	2100	5.13 (19.44)	0.416 (0.253)	16.90 (3.33)	
<b>Standard Power Take-off Speed—(PTO speed—1000 rpm)</b>					
88.09 (65.69)	2066	5.17 (19.55)	0.412 (0.251)	17.05 (3.36)	
<b>Maximum Power (2 hours)</b>					
89.43 (66.69)	1900	5.05 (19.13)	0.397 (0.241)	17.70 (3.49)	

#### VARYING POWER AND FUEL CONSUMPTION

86.77 (64.70)	2100	5.13 (19.44)	0.416 (0.253)	16.90 (3.33)	Air temperature
75.39 (56.22)	2153	4.66 (17.63)	0.434 (0.264)	16.19 (3.19)	75°F (24°C)
57.02 (42.52)	2191	3.93 (14.88)	0.484 (0.294)	14.51 (2.86)	Relative humidity
38.71 (28.87)	2238	2.90 (11.00)	0.527 (0.321)	13.33 (2.63)	58%
19.32 (14.41)	2268	2.09 (7.92)	0.761 (0.463)	9.23 (1.82)	Barometer
1.06 (0.79)	2292	1.41 (5.34)	9.377 (5.704)	0.75 (0.15)	29.01" Hg (98.24 kPa)

Maximum Torque - 266 lb.-ft. (360 Nm) at 1648 rpm

Maximum Torque Rise - 22.5%

Torque rise at 1701 engine rpm - 22%

#### 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)
<b>Maximum Power—5th (B2) Gear</b>									
72.87 (54.34)	5736 (25.51)	4.76 (7.67)	2098	9.57	0.500 (0.304)	14.06 (2.77)	186 (86)	63 (17)	28.91 (97.90)
<b>75% of Pull at Maximum Power—5th (B2) Gear</b>									
58.89 (43.91)	4307 (19.16)	5.13 (8.25)	2188	6.50	0.533 (0.324)	13.17 (2.59)	181 (83)	69 (21)	28.92 (97.93)
<b>50% of Pull at Maximum Power—5th (B2) Gear</b>									
41.14 (30.68)	2876 (12.79)	5.37 (8.64)	2234	4.42	0.585 (0.356)	12.00 (2.36)	172 (78)	71 (22)	28.93 (97.97)
<b>75% of Pull at Reduced Engine Speed—6th (B3) Gear</b>									
58.93 (43.94)	4285 (19.06)	5.16 (8.30)	1769	6.50	0.482 (0.293)	14.58 (2.87)	183 (84)	70 (21)	28.93 (97.97)
<b>50% of Pull at Reduced Engine Speed—6th (B3) Gear</b>									
41.15 (30.69)	2874 (12.78)	5.37 (8.64)	1798	4.27	0.513 (0.312)	13.70 (2.70)	170 (77)	72 (22)	28.93 (97.97)

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

**Dates of Test:** September 10-23, 2002

**Manufacturer:** Industrious John Deere, Boulevard Valdez Sanchez # 470, Saltillo, Coahuila CP25005 Mexico

**FUEL, OIL and TIME:** Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8435 Fuel weight 7.023 lbs/gal (0.842 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: 18.0 hours

**ENGINE: Make** John Deere Diesel **Type** Four cylinder vertical with turbocharger **Serial No.** \*PE4045T164885\* **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** 276 cu in (4525 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **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** thermostat

**ENGINE OPERATING PARAMETERS: Fuel rate:** 34.8 - 37.0 lb/h (15.8 - 16.8 kg/h) **High idle:** 2250 - 2300 rpm **Turbo boost:** nominal 8.0 - 10.9 psi (55 - 75 kPa) as measured 10.5 psi (72 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** \*PO6403X01179\* **Tread width** rear 59.7" (1516 mm) to 79.4" (2016 mm) front 59.5" (1512 mm) to 79.3" (2016 mm) **Wheelbase** 90.9" (2310 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.79 (2.88) second 2.45 (3.95) third 3.05 (4.91) fourth 3.79 (6.10) fifth 5.19 (8.36) sixth 6.46 (10.39) seventh 10.53 (16.94) eighth 14.43 (23.23) ninth 17.93 (28.86) reverse 2.86 (4.61), 6.06 (9.76), 16.85 (27.11), **Clutch** dry disc operated by foot pedal **Brakes** wet disc operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2085 engine rpm or 1000 rpm at 2067 engine rpm **Unladen tractor mass** 8750 lb (3969 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		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	
4th(B1)Gear									
67.94 (50.67)	7636 (33.97)	3.34 (5.37)	2145	14.96	0.531 (0.323)	13.24 (2.61)	179 (82)	58 (14)	28.90 (97.87)
5th(B2)Gear									
72.87 (54.34)	5736 (25.51)	4.76 (7.67)	2098	9.57	0.500 (0.304)	14.06 (2.77)	186 (86)	63 (17)	28.91 (97.90)
6th(B3)Gear									
73.54 (54.84)	4535 (20.17)	6.08 (9.79)	2096	7.06	0.496 (0.302)	14.16 (2.79)	186 (86)	65 (18)	28.91 (97.90)

**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 129°F(54°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. **1808**, Nebraska Summary 374, December 13, 2002.

Leonard L. Bashford  
Director

V.I. Adamchuk  
M.F. Kocher  
W.P. Campbell  
Board of Tractor Test Engineers

**UNBALLASTED - FRONT DRIVE ENGAGED-1900 RPM**

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 (B1)Gear								
67.95 (50.67)	7634 (33.96)	3.34 (5.37)	2146	14.96	0.530 (0.322)	13.25 (2.61)	179 (82)	58 (14) 28.90 (97.87)
5th (B2)Gear								
73.82 (55.04)	6440 (28.65)	4.30 (6.92)	1932	11.25	0.485 (0.295)	14.48 (2.85)	185 (85)	64 (18) 28.91 (97.90)
6th (B3)Gear								
75.16 (56.05)	5176 (23.02)	5.45 (8.76)	1904	8.30	0.474 (0.288)	14.82 (2.92)	187 (86)	66 (19) 28.91 (97.90)
7th (C1)Gear								
73.33 (54.68)	2978 (13.25)	9.23 (14.86)	1897	4.34	0.486 (0.296)	14.45 (2.85)	186 (85)	67 (19) 28.92 (97.93)

TRACTOR SOUND LEVEL WITHOUT CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 5th (B2) gear	94.0	94.1
Transport speed - no load - 9th(C3) gear		96.4
Bystander in 9th (C3) Gear		83.8

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Two 18.4-34;8;12(85)	Two 18.4-34;8;12(85)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	1040 lb (472 kg)	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Two 13.6-24;8;20(125)	Two 13.6-24;8;12(85)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	1550 lb (703 kg)	None
<b>Height of Drawbar</b>	20.5 in (520 mm)	18.0 in (455 mm)
<b>Static Weight with operator</b> - Rear	6455 lb (2928 kg)	5695 lb (2583 kg)
- Front	5060 lb (2293 kg)	3230 lb (1465 kg)
- Total	11515 lb (5223 kg)	8925 lb (4048 kg)

**DRAWBAR PERFORMANCE**  
**BALLASTED - FRONT DRIVE DISENGAGED**  
**FUEL CONSUMPTION CHARACTERISTICS**

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	
<b>Maximum Power—5th (B2) Gear</b>									
69.44 (51.78)	5802 (25.81)	4.49 (7.22)	2097	12.91	0.522 (0.318)	13.45 (2.65)	186 (85)	64 (18)	28.76 (97.39)
<b>75% of Pull at Maximum Power—5th (B2) Gear</b>									
56.45 (42.10)	4349 (19.34)	4.87 (7.83)	2175	8.98	0.551 (0.335)	12.75 (2.51)	183 (84)	67 (19)	28.69 (97.16)
<b>50% of Pull at Maximum Power—5th (B2) Gear</b>									
39.86 (29.72)	2908 (12.93)	5.14 (8.27)	2223	5.94	0.599 (0.365)	11.72 (2.31)	173 (78)	69 (21)	28.70 (97.19)
<b>75% of Pull at Reduced Engine Speed—6th (B3) Gear</b>									
56.51 (42.14)	4371 (19.44)	4.85 (7.80)	1746	9.11	0.496 (0.302)	14.16 (2.79)	184 (84)	68 (20)	28.69 (97.16)
<b>50% of Pull at Reduced Engine Speed—6th (B3) Gear</b>									
39.84 (29.71)	2886 (12.84)	5.18 (8.33)	1801	5.87	0.530 (0.323)	13.24 (2.61)	170 (77)	70 (21)	28.70 (97.19)

**MAXIMUM POWER IN SELECTED GEARS**

4th (B1) Gear									
56.08 (41.82)	6357 (28.28)	3.31 (5.32)	2169	14.95	0.568 (0.345)	12.37 (2.44)	178 (81)	62 (17)	28.76 (97.39)
5th (B2) Gear									
69.44 (51.78)	5802 (25.81)	4.49 (7.22)	2097	12.91	0.522 (0.318)	13.45 (2.65)	186 (85)	64 (18)	28.76 (97.39)
6th (B3) Gear									
70.78 (52.78)	4572 (20.34)	5.81 (9.34)	2101	9.43	0.512 (0.311)	13.72 (2.70)	187 (86)	66 (19)	28.69 (97.16)

**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									
66.28 (49.42)	9273 (41.25)	2.68 (4.31)	2136	14.69	0.537 (0.327)	13.07 (2.57)	178 (81)	61 (16)	28.76 (97.39)
4th (B1) Gear									
71.75 (53.51)	8375 (37.25)	3.22 (5.18)	2018	12.72	0.504 (0.307)	13.94 (2.75)	181 (83)	63 (17)	28.76 (97.39)
5th (B2) Gear									
74.11 (55.26)	6410 (28.51)	4.34 (6.98)	1901	8.83	0.478 (0.291)	14.70 (2.89)	187 (86)	65 (18)	28.72 (97.26)
6th (B3) Gear									
74.03 (55.21)	5032 (22.38)	5.52 (8.88)	1901	6.71	0.478 (0.291)	14.70 (2.90)	187 (86)	66 (19)	28.69 (97.16)
7th (C1) Gear									
71.17 (53.07)	2878 (12.80)	9.27 (14.92)	1900	3.76	0.498 (0.303)	14.10 (2.78)	187 (86)	67 (19)	28.69 (97.16)

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

CATEGORY: II

Quick Attach: None

Maximum Force Exerted Through Whole Range: 4878 lbs (21.7 kN)

i) Opening pressure of relief valve: NA

Sustained pressure with relief valve open: 2960 psi (204 bar)

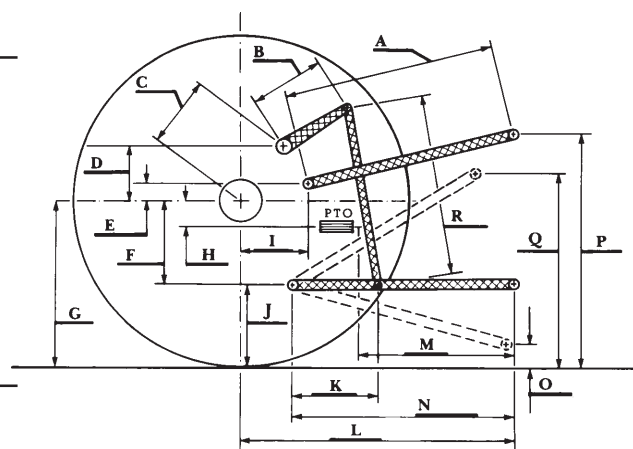
ii) Pump delivery rate at minimum pressure and rated engine speed: 13.4 GPM (50.7 l/min)

iii) Pump delivery rate at maximum

hydraulic power: 12.5 GPM (47.3 l/min)

Delivery pressure: 2545 psi (175 bar)

Power: 18.6 HP (13.8 kW)



### THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar)	2820 (194)
Location:	lift cylinder
Hydraulic oil temperature: °F (°C)	154 (68)
Location:	hydraulic sump
Category:	II
Quick attach:	No

#### SAE Static Test—System pressure 2540 psi (175 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	7272	6840	6476	5994	5126
" " " " " " (kN)	(32.4)	(30.4)	(28.8)	(26.7)	(22.8)

#### ASAE Static Test—System pressure 2750 psi (190 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	7879	7411	7041	6495	5573
" " " " " " (kN)	(35.1)	(33.0)	(31.3)	(28.9)	(24.8)

### HITCH DIMENSIONS AS TESTED—NO LOAD

	SAE TEST		OECD TEST	
	inch	mm	inch	mm
A	26.1	662	27.2	691
B	12.8	325	12.8	325
C	20.4	518	20.4	518
D	18.6	473	18.6	473
E	4.9	153	4.9	153
F	6.9	176	6.9	176
G	32.3	820	32.3	820
H	1.9	48	1.9	48
I	19.3	489	19.3	489
J	25.4	644	25.4	644
K	19.8	503	19.8	503
L	44.1	1121	44.1	1121
M	22.5	572	22.5	572
N	37.2	945	37.2	945
O	8.0	203	8.0	203
P	41.5	1054	49.4	1254
Q	32.9	835	32.9	835
R	31.1	791	31.1	791



### JOHN DEERE 6403 DIESEL

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