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## Test 1809: John Deere 6603 Diesel 9-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# NEBRASKA OECD TRACTOR TEST 1809—SUMMARY 375

## JOHN DEERE 6603 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>					
97.02 (72.35)	2100	5.67 (21.47)	0.411 (0.250)	17.11 (3.37)	
<b>Standard Power Take-off Speed—(PTO speed—1000 rpm)</b>					
98.37 (73.35)	2066	5.67 (21.47)	0.405 (0.246)	17.34 (3.42)	
<b>Maximum Power (2 hours)</b>					
101.71 (75.85)	1950	5.65 (21.38)	0.390 (0.237)	18.01 (3.55)	

#### VARYING POWER AND FUEL CONSUMPTION

97.02 (72.35)	2100	5.67 (21.47)	0.411 (0.250)	17.11 (3.37)	Air temperature
85.45 (63.72)	2182	5.30 (20.05)	0.435 (0.265)	16.13 (3.18)	79°F (26°C)
65.31 (48.71)	2215	4.49 (16.98)	0.482 (0.293)	14.56 (2.87)	Relative humidity
43.98 (32.80)	2246	3.46 (13.10)	0.553 (0.336)	12.71 (2.50)	68%
22.51 (16.79)	2272	2.56 (9.70)	0.799 (0.486)	8.78 (1.73)	Barometer
1.06 (0.79)	2293	1.75 (6.63)	11.640 (7.080)	0.60 (0.12)	28.84" Hg (97.66 kPa)

Maximum Torque - 333 lb.-ft. (452 Nm) at 1101 rpm

Maximum Torque Rise - 37.4%

Torque rise at 1699 engine rpm - 24%

#### 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>									
82.01 (61.16)	6006 (26.72)	5.12 (8.24)	2097	8.53	0.488 (0.297)	14.40 (2.84)	185 (85)	64 (18)	29.00 (98.21)
<b>75% of Pull at Maximum Power—5th (B2) Gear</b>									
65.95 (49.18)	4500 (20.01)	5.50 (8.85)	2195	6.11	0.537 (0.327)	13.07 (2.57)	181 (83)	64 (18)	29.00 (98.21)
<b>50% of Pull at Maximum Power—5th (B2) Gear</b>									
45.67 (34.06)	3004 (13.36)	5.70 (9.18)	2228	4.03	0.628 (0.382)	11.18 (2.20)	183 (84)	67 (19)	29.03 (98.31)
<b>75% of Pull at Reduced Engine Speed—6th (B3) Gear</b>									
65.95 (49.18)	4511 (20.07)	5.48 (8.82)	1761	5.88	0.464 (0.282)	15.12 (2.98)	183 (84)	64 (18)	29.01 (98.24)
<b>50% of Pull at Reduced Engine Speed—6th (B3) Gear</b>									
45.75 (34.12)	3007 (13.38)	5.71 (9.18)	1793	4.03	0.526 (0.320)	13.35 (2.63)	181 (83)	68 (20)	29.03 (98.31)

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

**Dates of Test:** September 6-23, 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: 23.0 hours

**ENGINE: Make** John Deere Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** \*PE6068T164824\* **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 **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:** 38.1 - 40.3 lb/h (17.3 - 18.3 kg/h) **High idle:** 2250 - 2300 rpm **Turbo boost:** nominal 5.0 - 7.8 psi (34 - 54 kPa) as measured 7.3 psi (50 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** \*PO6603X01054\* **Tread width** rear 59.7" (1516 mm) to 79.4" (2016 mm) front 59.5" (1512 mm) to 79.3" (2016 mm) **Wheelbase** 103.8" (2636 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.91 (3.07) second 2.62 (4.21) third 3.25 (5.23) fourth 4.04 (6.50) fifth 5.54 (8.91) sixth 6.87 (11.06) seventh 11.21 (18.04) eighth 15.37 (24.74) ninth 19.10 (30.74) reverse 3.05 (4.91), 6.46 (10.39), 17.94 (28.87), **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** 9405 lb (4266 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th(B1)Gear									
78.11 (58.25)	8307 (36.95)	3.53 (5.67)	2123	14.55	0.512 (0.311)	13.73 (2.70)	182 (83)	61 (16)	29.00 (98.21)
5th(B2)Gear									
82.01 (61.16)	6006 (26.72)	5.12 (8.24)	2097	8.53	0.488 (0.297)	14.40 (2.84)	185 (85)	64 (18)	29.00 (98.21)
6th(B3)Gear									
81.14 (60.50)	4670 (20.77)	6.52 (10.49)	2092	6.03	0.491 (0.299)	14.29 (2.82)	184 (84)	64 (18)	28.99 (98.17)

**UNBALLASTED - FRONT DRIVE ENGAGED-1950 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th (B1)Gear									
77.99 (58.16)	8348 (37.13)	3.50 (5.64)	2114	14.73	0.512 (0.311)	13.71 (2.70)	182 (83)	59 (15)	29.00 (98.21)
5th(B2)Gear									
84.53 (63.03)	6783 (30.17)	4.67 (7.52)	1953	10.29	0.469 (0.285)	14.97 (2.95)	185 (85)	64 (18)	29.00 (98.21)
6th(B3)Gear									
85.29 (63.60)	5318 (23.65)	6.01 (9.68)	1953	7.00	0.467 (0.284)	15.05 (2.97)	185 (85)	64 (18)	28.99 (98.17)

**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 127°F (53°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. **1809**, Nebraska Summary 375, December 13, 2002.

Leonard L. Bashford  
Director

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

TRACTOR SOUND LEVEL WITHOUT CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 4th (B1) gear	93.6	93.3
Transport speed-no load- 9th(C3) gear		94.8
Bystander in 9th (C3) Gear		84.6

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Two 18.4-38;8;12(85)	Two 18.4-38;8;12(85)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	1000 lb (454 kg)	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Two 14.9-24;6;18(125)	Two 14.9-24;6;12(85)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	1525 lb (692 kg)	None
<b>Height of Drawbar</b>	22.0 in (560 mm)	19.5 in (495 mm)
<b>Static Weight with operator</b> - Rear	6845 lb (3105 kg)	6050 lb (2744 kg)
- Front	5260 lb (2386 kg)	3530 lb (1601 kg)
- Total	12105 lb (5491 kg)	9580 lb (4345 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.	
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med	Air dry bulb	inch Hg (kPa)
<b>Maximum Power—5th (B2) Gear</b>									
78.66 (58.66)	6111 (27.18)	4.83 (7.77)	2099	11.05	0.506 (0.308)	13.87 (2.73)	184 (84)	64 (18)	28.90 (97.87)
<b>75% of Pull at Maximum Power—5th (B2) Gear</b>									
64.54 (48.13)	4582 (20.38)	5.28 (8.50)	2199	7.06	0.541 (0.329)	12.97 (2.56)	184 (84)	66 (19)	28.90 (97.87)
<b>50% of Pull at Maximum Power—5th (B2) Gear</b>									
44.94 (33.51)	3059 (13.61)	5.51 (8.87)	2228	4.48	0.628 (0.382)	11.17 (2.20)	181 (83)	69 (21)	28.91 (97.90)
<b>75% of Pull at Reduced Engine Speed—6th (B3) Gear</b>									
64.33 (47.97)	4581 (20.38)	5.27 (8.48)	1766	7.21	0.473 (0.288)	14.84 (2.92)	182 (83)	67 (19)	28.91 (97.90)
<b>50% of Pull at Reduced Engine Speed—6th (B3) Gear</b>									
44.83 (33.43)	3026 (13.46)	5.56 (8.94)	1808	4.41	0.530 (0.322)	13.25 (2.61)	181 (83)	72 (22)	28.90 (97.90)
<b>MAXIMUM POWER IN SELECTED GEARS</b>									
4th (B1) Gear									
65.90 (49.14)	7034 (31.29)	3.51 (5.65)	2190	14.94	0.559 (0.340)	12.56 (2.47)	183 (84)	63 (17)	28.90 (97.87)
5th (B2) Gear									
78.66 (58.66)	6111 (27.18)	4.83 (7.77)	2099	11.05	0.506 (0.308)	13.87 (2.73)	184 (84)	64 (18)	28.90 (97.87)
6th (B3) Gear									
79.52 (59.30)	4781 (21.26)	6.24 (10.04)	2099	7.49	0.500 (0.304)	14.04 (2.77)	184 (84)	65 (18)	28.90 (97.87)

**DRAWBAR PERFORMANCE  
BALLASTED - FRONT DRIVE ENGAGED (1950 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.	
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med	Air dry bulb	inch Hg (kPa)
3rd (A3) Gear									
76.71 (57.21)	10188 (45.32)	2.82 (4.54)	2123	14.69	0.522 (0.318)	13.45 (2.65)	182 (83)	62 (17)	28.90 (97.87)
4th (B1) Gear									
82.48 (61.51)	9131 (40.62)	3.39 (5.45)	1990	12.07	0.482 (0.293)	14.56 (2.87)	184 (84)	63 (17)	28.90 (97.87)
5th (B2) Gear									
84.92 (63.33)	6596 (29.34)	4.83 (7.77)	1957	7.05	0.466 (0.283)	15.08 (2.97)	186 (85)	65 (18)	28.90 (97.87)
6th (B3) Gear									
84.29 (62.85)	5191 (23.09)	6.09 (9.80)	1949	5.33	0.467 (0.284)	15.04 (2.96)	185 (85)	66 (19)	28.90 (97.87)

### 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: 2890 psi (206 bar)

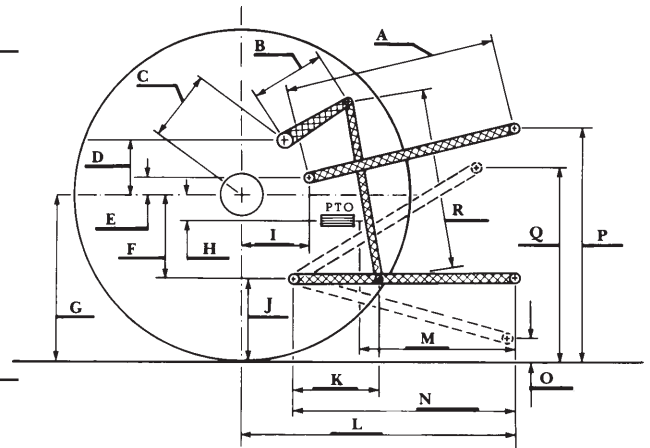
ii) Pump delivery rate at minimum pressure and rated engine speed: 16.6 GPM (62.8 l/min)

iii) Pump delivery rate at maximum

hydraulic power: 15.0 GPM (56.8 l/min)

Delivery pressure: 2610 psi (180 bar)

Power: 22.8 HP (17.0 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	5125
" " " " " " (kN)	(32.4)	(30.4)	(28.8.1)	(26.7)	(22.8)

#### ASAE Static Test—System pressure 2750 psi (189 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 6603 DIESEL**

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 Institute of Agriculture and Natural Resources  
 University of Nebraska-Lincoln  
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