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## Test 1664: John Deere 7600 Powerquad Diesel 16-Speed

Nebraska Tractor Test Lab

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

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# NEBRASKA OECD TRACTOR TEST 1664—SUMMARY 131

## JOHN DEERE 7600 POWRQUAD DIESEL

### 16 SPEED

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

**Dates of Test:** April 21 to May 12, 1993

**Manufacturer:** John Deere Tractor Works, P.O.  
Box 270, Waterloo, Iowa 50704

#### 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—1006 rpm)</b>					
110.90 (82.70)	2099	6.46 (24.45)	0.405 (0.246)	17.17 (3.38)	
<b>Maximum Power (2 hours)</b>					
113.04 (84.30)	2000	6.42 (24.32)	0.395 (0.241)	17.60 (3.47)	

#### VARYING POWER AND FUEL CONSUMPTION

110.90 (82.70)	2099	6.46 (24.45)	0.405 (0.246)	17.17 (3.38)	Air temperature
97.91 (73.01)	2180	5.99 (22.69)	0.426 (0.259)	16.34 (3.22)	75°F (24°C)
74.50 (55.56)	2211	5.09 (19.26)	0.475 (0.289)	14.64 (2.88)	Relative humidity
50.32 (37.52)	2241	4.14 (15.67)	0.572 (0.348)	12.16 (2.39)	31%
25.47 (18.99)	2268	3.19 (12.08)	0.872 (0.530)	7.98 (1.57)	Barometer
0.42 (0.31)	2294	2.24 (8.49)	37.247 (22.657)	0.19 (0.04)	29.20" Hg (98.87 kPa)

Maximum Torque 391 lb.-ft. (530 Nm) at 1351 rpm  
Maximum Torque Rise 40.8%  
Torque rise at 1698 engine rpm 24.0%

#### DRAWBAR PERFORMANCE

##### 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 7th (B3) Gear</b>									
100.57 (74.99)	8948 (39.80)	4.21 (6.78)	2105	3.83	0.448 (0.273)	15.53 (3.06)	193 (89)	68 (20)	29.04 (98.34)
<b>75% of Pull at Maximum Power 7th (B3) Gear</b>									
79.77 (59.49)	6715 (29.87)	4.45 (7.17)	2191	2.46	0.489 (0.297)	14.24 (2.81)	189 (87)	72 (22)	28.94 (98.00)
<b>50% of Pull at Maximum Power 7th (B3) Gear</b>									
54.46 (40.61)	4476 (19.91)	4.56 (7.34)	2223	1.72	0.575 (0.350)	12.11 (2.39)	186 (85)	72 (22)	28.94 (98.00)
<b>75% of Pull at Reduced Engine Speed 10th (C2) Gear</b>									
79.85 (59.54)	6709 (29.84)	4.46 (7.18)	1653	2.54	0.433 (0.263)	16.07 (3.17)	196 (91)	72 (22)	28.94 (98.00)
<b>50% of Pull at Reduced Engine Speed 10th (C2) Gear</b>									
54.35 (40.53)	4490 (19.97)	4.54 (7.31)	1665	1.72	0.478 (0.291)	14.56 (2.87)	189 (87)	72 (22)	28.94 (98.00)

**FUEL OIL and TIME:** Fuel No. 2 Diesel Cetane No. 53.9 Specific gravity converted to 60°/60° F (15°/15°C) 0.8357 Fuel weight 6.958 lbs/gal (0.834 kg/l) Oil SAE 15W-40 API service classification SG/CE To motor 5.103 gal (19.315 l) Drained from motor 4.942 gal (18.707 l) Transmission and hydraulic lubricant John Deere Hy-Gard fluid Front axle lubricant John Deere GL-5 Gear Lubricant Total time engine was operated 22.5 hours.

**ENGINE:** Make John Deere Diesel Type six cylinder vertical with turbocharger Serial No. \*TO6068T398257\* Crankshaft lengthwise Rated engine speed 2100 Bore and stroke (as specified) 4.19" × 5.0" (106.5 mm × 127.0 mm) Compression ratio 17.2 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 Fuel cooler radiator for inlet fuel Muffler underhood Exhaust vertical Cooling medium temperature control two thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS:** Fuel rate: 43.2-46.3 lb/h (19.6-21.0 kg/h) High idle: 2225-2325 rpm Turbo boost nominal 8.7-10.2 psi (60-70 kPa) as measured 9.0 psi (62 kPa)

**CHASSIS:** Type front wheel assist Serial No. \*RW7600H 002170\* Tread width rear 59.8" (1518 mm) to 100.3" (2548 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) Wheel base 110.2" (2800 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio with partial (4) range operator controlled powershift Nominal travel speeds mph (km/h) first 1.41 (2.27) second 1.70 (2.74) third 2.04 (3.28) fourth 2.50 (4.02) fifth 3.00 (4.82) sixth 3.61 (5.81) seventh 4.32 (6.95) eighth 4.77 (7.67) ninth 5.29 (8.51) tenth 5.74 (9.24) eleventh 6.87 (11.05) twelfth 8.42 (13.55) thirteenth 10.02 (16.13) fourteenth 12.07 (19.43) fifteenth 14.45 (23.25) sixteenth 17.71 (28.50) reverse 1.67 (2.69), 2.02 (3.25), 2.42 (3.89), 2.96 (4.76), 3.55 (5.71), 4.28 (6.89), 5.12 (8.24), 5.65 (9.09), 6.27 (10.09), 6.81 (10.96), 8.15 (13.11), 9.98 (16.06) Clutch multiple wet disc hydraulically actuated by foot pedal Brakes wet multiple disc hydraulically actuated by two foot pedals which can be locked together Steering hydrostatic Power take-off 540 rpm at 2072 engine rpm and 1000 rpm at 2086 engine rpm Unladen tractor mass 14644 lb (6642 kg)

# **DRAWBAR PERFORMANCE** **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/kWh)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th (A4) Gear									
85.06 (63.43)	14351 (63.84)	2.22 (3.58)	2161	14.40	0.518 (0.315)	13.44 (2.65)	186 (86)	59 (15)	29.00 (98.21)
5th (B1) Gear									
96.34 (71.84)	12988 (57.77)	2.78 (4.48)	2109	8.49	0.468 (0.284)	14.88 (2.93)	188 (87)	65 (18)	29.01 (98.24)
6th (B2) Gear									
99.44 (74.15)	11376 (50.60)	3.28 (5.28)	2011	6.15	0.446 (0.272)	15.59 (3.07)	191 (88)	67 (19)	29.03 (98.31)
7th (B3) Gear									
101.92 (76.00)	9568 (42.56)	3.99 (6.43)	2004	4.14	0.439 (0.267)	15.84 (3.12)	193 (89)	67 (19)	29.04 (98.34)
8th (C1) Gear									
100.62 (75.03)	8497 (37.80)	4.44 (7.15)	2001	3.51	0.442 (0.269)	15.75 (3.10)	194 (90)	71 (22)	29.04 (98.34)
9th (B4) Gear									
100.62 (75.03)	7601 (33.81)	4.96 (7.99)	2003	3.03	0.441 (0.268)	15.77 (3.11)	191 (88)	72 (22)	29.00 (98.21)
10th (C2) Gear									
101.14 (75.42)	7029 (31.27)	5.40 (8.68)	2000	2.70	0.440 (0.268)	15.80 (3.11)	194 (90)	73 (23)	28.98 (98.14)
11th (C3) Gear									
100.22 (74.74)	5743 (25.55)	6.54 (10.53)	2013	2.22	0.445 (0.271)	15.64 (3.08)	193 (89)	73 (23)	28.96 (98.07)
12th (C4) Gear									
96.65 (72.07)	4224 (20.12)	8.01 (12.89)	2002	1.80	0.460 (0.280)	15.11 (2.98)	195 (91)	72 (22)	28.95 (89.04)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
Gear closest to 4.7 mph (7.5 km/h) 8th (C1) Gear	71.0	71.0
Maximum sound level	72.0	72.0
Transport speed 16th (D4) Gear	72.5	...
Bystander 16th (D4) Gear	82.0	...

## **TIRES, BALLAST AND WEIGHT**

**Rear Tires**—No., size, ply & psi (kPa)  
**Front Tires**—No., size, ply & psi (kPa)

## **Tested Without Ballast**

Two 18.4R38; \*\*, 16 (110)  
Two 13.6R28; \*\*\*, 23 (160)

## **Height of Drawbar**

19.5 in (495 mm)

**Static Weight with Operator**—Rear  
—Front  
—Total

9784 lb (4438 kg)  
5026 lb (2280 kg)  
14810 lb (6717 kg)

**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 return was maintained at 157° F (70°C). The performance results on this summary were taken from OECD tests conducted under the Code II Restricted Standard Test Code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1664**, Summary 131, July 6, 1993.

LOUIS I. LEVITICUS

Engineer-in-Charge

L.L. BASHFORD

R.D. GRISSO

K. VON BARGEN

Board of Tractor Test Engineers

# **DRAWBAR PERFORMANCE (FRONT DRIVE DISENGAGED)** **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 8th (C1) Gear</b>									
99.81 (74.43)	8124 (36.14)	4.61 (7.41)	2096	4.48	0.453 (0.276)	15.35 (3.02)	193 (89)	70 (21)	29.03 (98.31)
<b>75% of Pull at Maximum Power 8th (C1) Gear</b>									
79.52 (59.30)	6100 (27.13)	4.89 (7.87)	2186	2.89	0.494 (0.301)	14.08 (2.77)	188 (87)	72 (22)	28.93 (97.97)
<b>50% of Pull at Maximum Power 8th (C1) Gear</b>									
54.35 (40.53)	4060 (18.06)	5.02 (8.08)	2222	1.91	0.587 (0.357)	11.85 (2.33)	185 (85)	72 (22)	28.93 (97.97)
<b>75% of Pull at Reduced Engine Speed 11th (C3) Gear</b>									
79.69 (59.42)	6088 (27.08)	4.91 (7.90)	1522	2.65	0.433 (0.264)	16.06 (3.16)	188 (86)	72 (22)	28.93 (97.97)
<b>50% of Pull at Reduced Engine Speed 11th (C3) Gear</b>									
54.56 (40.68)	4064 (18.08)	5.03 (8.10)	1545	1.75	0.473 (0.288)	14.72 (2.90)	186 (85)	72 (22)	28.93 (97.97)
<b>MAXIMUM POWER IN SELECTED GEARS</b>									
<b>5th (B1) Gear</b>									
79.73 (59.45)	11111 (49.42)	2.69 (4.33)	2175	14.23	0.529 (0.322)	13.16 (2.59)	188 (87)	66 (19)	29.02 (98.27)
<b>6th (B2) Gear</b>									
91.84 (68.49)	10786 (47.98)	3.19 (5.14)	2103	12.62	0.491 (0.299)	14.17 (2.79)	192 (89)	67 (19)	29.03 (98.31)
<b>7th (B3) Gear</b>									
98.85 (73.71)	8942 (39.77)	4.15 (6.67)	2102	5.25	0.454 (0.276)	15.33 (3.02)	195 (90)	69 (21)	29.04 (98.34)
<b>8th (C1) Gear</b>									
99.81 (74.43)	8124 (36.14)	4.61 (7.41)	2096	4.48	0.453 (0.276)	15.35 (3.02)	193 (89)	70 (21)	29.03 (98.31)
<b>9th (B4) Gear</b>									
97.60 (72.78)	7061 (31.41)	5.18 (8.34)	2103	3.45	0.460 (0.280)	15.12 (2.98)	193 (89)	72 (22)	28.99 (98.17)
<b>10th (C2) Gear</b>									
99.52 (74.22)	6626 (29.47)	5.63 (9.06)	2098	3.29	0.453 (0.275)	15.37 (3.03)	193 (89)	73 (23)	28.98 (98.14)
<b>11th (C3) Gear</b>									
97.64 (72.81)	5380 (23.93)	6.81 (10.95)	2101	2.49	0.461 (0.280)	15.10 (2.97)	192 (89)	73 (23)	28.96 (98.07)
<b>12th (C4) Gear</b>									
94.10 (70.17)	4211 (18.73)	8.38 (13.49)	2100	1.91	0.479 (0.291)	14.52 (2.86)	195 (90)	72 (22)	28.95 (98.04)

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

CATEGORY: III

Quick Attach: Walterscheid lower link ends

Maximum Force Exerted Through Whole Range:	10161 lbs	(45.2 kN)
i) Opening pressure of relief valve:	NA	
Sustained pressure with pump stalled:	2870 psi	(198 bar)
ii) Pump delivery rate at minimum pressure:	26.4 GPM	(99.9 l/min)
iii) Pump delivery rate at maximum		
hydraulic power:	24.8 GPM	(93.9 l/min)
Delivery pressure:	2530 psi	(174 bar)
Power:	36.6 HP	(27.3 kW)

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

Observed Maximum Pressure psi. (bar)	2880 (198)
Location	remote outlet
Hydraulic oil temperature °F (°C)	144 (62)
Location	hydraulic sump
Category	IIIN
Quick attach	No

With lift cylinders—2 × 70 mm

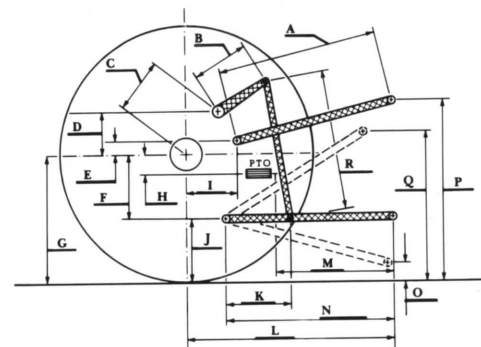
Hitch point distance to ground level in (mm)	7.9 (201)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	10514	10436	10111	9384	7910
Lift force on frame (kN)	(46.8)	(46.4)	(45.0)	(41.7)	(35.2)

With lift cylinders—1 × 70 mm and 1 × 80 mm

Hitch point distance to ground level (mm)	8.1 (206)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb	11959	11949	11605	10760	9168
Lift force on frame (kN)	(53.2)	(53.2)	(51.6)	(47.9)	(40.8)

With lift cylinders—2 × 80 mm

Hitch point distance to ground level in. (mm)	7.7 (196)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	13295	13718	13295	12303	10426
Lift force on frame (kN)	(59.1)	(61.0)	(59.1)	(54.7)	(46.4)



HITCH DIMENSIONS AS TESTED—NO LOAD

	OECD test		SAE test	
	inch	mm	inch	mm
A	27.2	692	26.6	676
B	14.8	375	14.8	375
C	24.5	623	24.5	623
D	23.1	588	23.1	588
E	11.1	283	7.5	190
F	10.8	275	10.8	275
G	35.6	905	34.3	870
H	4.1	105	4.1	105
I	19.8	504	19.8	504
J	24.8	630	23.4	595
K	24.1	612	23.1	587
L	47.5	1206	46.4	1179
M	23.1	586	22.0	559
N	39.8	1011	38.7	984
O	9.0	229	8.0	203
P	51.8	1315	45.4	1153
Q	38.8	984	36.8	933
R	38.1	968	35.9	911



JOHN DEERE 7600 POWRQUAD DIESEL

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