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January 1997

## Test 1724: John Deere 7610 Powrquad 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 1724—SUMMARY 224

## JOHN DEERE 7610 POWRQUAD DIESEL

### 16 SPEED

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

**Dates of Test:** May 27 to June 18, 1997

**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—1007 rpm)</b>					
115.94 (86.46)	2100	6.89 (26.07)	0.417 (0.254)	16.84 (3.32)	
<b>Maximum Power (2 hours)</b>					
118.07 (88.05)	1950	6.76 (25.59)	0.402 (0.244)	17.47 (3.44)	

#### VARYING POWER AND FUEL CONSUMPTION

115.94 (86.46)	2100	6.89 (26.07)	0.417 (0.254)	16.84 (3.32)	Air temperature
102.44 (76.39)	2175	6.41 (24.28)	0.439 (0.267)	15.97 (3.15)	76°F (24°C)
77.12 (57.51)	2208	5.34 (20.23)	0.486 (0.296)	14.43 (2.84)	Relative humidity
52.40 (39.08)	2235	4.36 (16.51)	0.584 (0.355)	12.02 (2.37)	56%
26.32 (19.62)	2261	3.25 (12.30)	0.866 (0.527)	8.10 (1.60)	Barometer
1.04 (0.78)	2284	2.18 (8.25)	14.677 (8.928)	0.48 (0.09)	29.02" Hg (98.27 kPa)

Maximum Torque 410 lb.-ft. (556 Nm) at 1298 rpm  
Maximum Torque Rise 41.5%  
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 8th (C1) Gear</b>									
103.19 (76.95)	8265 (36.76)	4.68 (7.53)	2101	3.03	0.467 (0.284)	15.02 (2.96)	190 (88)	69 (21)	29.07 (98.44)
<b>75% of Pull at Maximum Power 8th (C1) Gear</b>									
81.57 (60.83)	6201 (27.58)	4.93 (7.94)	2194	2.22	0.505 (0.307)	13.91 (2.74)	189 (87)	72 (22)	29.05 (98.37)
<b>50% of Pull at Maximum Power 8th (C1) Gear</b>									
55.62 (41.47)	4136 (18.40)	5.04 (8.12)	2227	1.39	0.594 (0.361)	11.82 (2.33)	186 (86)	74 (23)	29.07 (98.44)
<b>75% of Pull at Reduced Engine Speed 11th (C3) Gear</b>									
81.60 (60.85)	6188 (27.53)	4.94 (7.96)	1526	2.14	0.441 (0.268)	15.91 (3.14)	190 (88)	73 (23)	29.06 (98.41)
<b>50% of Pull at Reduced Engine Speed 11th (C3) Gear</b>									
55.62 (41.48)	4136 (18.40)	5.04 (8.12)	1544	1.39	0.485 (0.295)	14.48 (2.85)	182 (83)	74 (23)	29.06 (98.41)

**FUEL OIL and TIME:** Fuel No. 2 Diesel Cetane  
No. 50.6 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  
CD, CE, CF-4 To motor 4.606 gal (17.435 l) Drained  
from motor 4.516 gal (17.093 l) Transmission  
and hydraulic lubricant John Deere Hy-Gard fluid  
Front axle lubricant John Deere Hy-Gard fluid and  
API GL-5 Gear Lubricant Total time engine was  
operated 30.5 hours.

**ENGINE:** Make John Deere Diesel Type six  
cylinder vertical with turbocharger Serial No.  
\*TO6068T705508\* Crankshaft lengthwise Rated  
engine speed 2100 Bore and stroke (as specified)  
4.19" × 5.0" (106.5 mm × 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 Fuel cooler radiator for return fuel Muffler  
underhood Exhaust vertical Cooling medium  
temperature control two thermostats and variable  
speed fan

**ENGINE OPERATING PARAMETERS:** Fuel  
rate: 47.2-48.9 lb/h (21.4-22.2 kg/h) Highidle: 2225-  
2325 rpm Turbo boost nominal 7.5-11.9 psi (52-82  
kPa) as measured 10.4 psi (71 kPa)

**CHASSIS:** Type front wheel assist Serial No.  
\*RW7610H001323\* Tread width rear 60.0" (1525  
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 parial (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 3.60  
(5.80) seventh 4.32 (6.95) eighth 4.77 (7.67) ninth 5.29  
(8.51) tenth 5.74 (9.23) eleventh 6.87 (11.06) twelfth  
8.42 (13.55) thirteenth 9.88 (15.90) fourteenth 11.90  
(19.15) fifteenth 14.24 (22.93) sixteenth 17.45 (28.09)  
reverse 1.68 (2.70), 2.02 (3.25), 2.42 (3.89), 2.96 (4.76),  
3.55 (5.71), 4.28 (6.88), 5.12 (8.24), 5.65 (9.09), 6.28  
(10.10), 6.80 (10.95), 8.15 (13.12), 9.99 (16.07), 11.72  
(18.86), 14.11 (22.71), 16.90 (27.20), 20.70 (33.32)  
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

# **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)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>4th (A4) Gear</b>									
82.18 (61.28)	13610 (60.54)	2.26 (3.64)	2178	13.53	0.548 (0.334)	12.79 (2.52)	184 (84)	58 (14)	28.99 (98.17)
<b>5th (B1) Gear</b>									
96.89 (72.25)	12900 (57.38)	2.82 (4.53)	2142	8.83	0.494 (0.301)	14.20 (2.80)	186 (86)	64 (18)	28.99 (98.17)
<b>6th (B2) Gear</b>									
101.78 (75.89)	12084 (53.75)	3.16 (5.08)	1962	7.40	0.464 (0.282)	15.13 (2.98)	191 (88)	69 (21)	29.00 (98.21)
<b>7th (B3) Gear</b>									
104.34 (77.81)	10108 (44.96)	3.87 (6.23)	1952	4.68	0.452 (0.275)	15.51 (3.05)	188 (86)	71 (22)	29.00 (98.21)
<b>8th (C1) Gear</b>									
104.50 (77.92)	9113 (40.53)	4.30 (6.92)	1949	3.98	0.454 (0.276)	15.45 (3.04)	189 (87)	72 (22)	29.00 (98.21)
<b>9th (B4) Gear</b>									
104.43 (77.87)	8160 (36.30)	4.80 (7.72)	1948	3.35	0.456 (0.277)	15.38 (3.03)	189 (87)	72 (22)	29.00 (98.21)
<b>10th (C2) Gear</b>									
105.62 (78.76)	7584 (33.73)	5.22 (8.41)	1947	3.11	0.454 (0.276)	15.45 (3.04)	190 (88)	73 (23)	29.01 (98.24)
<b>11th (C3) Gear</b>									
104.67 (78.05)	6217 (27.65)	6.31 (10.16)	1951	2.30	0.455 (0.277)	15.41 (3.04)	189 (87)	73 (23)	29.01 (98.24)
<b>12th (C4) Gear</b>									
102.68 (76.57)	4957 (22.02)	7.77 (12.50)	1948	1.72	0.463 (0.282)	15.14 (2.98)	193 (89)	72 (22)	29.01 (98.24)
<b>13th (D1) Gear</b>									
100.33 (74.82)	4099 (18.23)	9.18 (14.77)	1954	1.39	0.478 (0.291)	14.67 (2.89)	190 (88)	72 (22)	29.01 (98.24)

<b>TRACTOR SOUND LEVEL WITH CAB</b>	<b>Front Wheel Drive</b>	
	<b>Disengaged dB(A)</b>	<b>Engaged dB(A)</b>
At 75% load in 7th (B3) Gear	74.5	74.4
Bystander 16th (D4) Gear	79.8	—

## **TIRES, BALLAST AND WEIGHT**

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

**Tested Without Ballast**  
Two 18.4R38; \*, 13 (90)  
Two 13.6R28; \*\*\*, 15 (105)

**Height of Drawbar**

21.0 in (535 mm)

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

9575 lb (4343 kg)  
5070 lb (2300 kg)  
14645 lb (6643 kg)

2072 engine rpm and 1000 rpm at 2086 engine rpm  
**Unladen tractor mass** 14480 lb (6568 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 172° F (78°C). This tractor did not meet the manufacturer's claim of 72.0 dB(A) cab sound level. 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. **1724**, Summary 224, July 7, 1997.

LOUIS I. LEVITICUS  
Engineer-in-Charge

L.L. BASHFORD  
R.D. GRISSO  
M.F. KOCHER  
Board of Tractor Test Engineers

## DRAWBAR PERFORMANCE (UNBALLASTED—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>									
101.86 (75.96)	8352 (37.15)	4.57 (7.36)	2094	5.23	0.474 (0.288)	14.80 (2.92)	188 (86)	71 (72)	29.00 (98.21)
<b>75% of Pull at Maximum Power 8th (C1) Gear</b>									
81.89 (61.07)	6275 (27.91)	4.89 (7.88)	2189	3.03	0.511 (0.311)	13.74 (2.71)	187 (86)	73 (23)	29.06 (98.41)
<b>50% of Pull at Maximum Power 8th (C1) Gear</b>									
56.04 (41.79)	4174 (18.56)	5.04 (8.10)	2225	1.72	0.593 (0.361)	11.83 (2.33)	186 (86)	74 (23)	29.06 (98.41)
<b>75% of Pull at Reduced Engine Speed 11th (C3) Gear</b>									
81.88 (61.06)	6249 (27.80)	4.91 (7.91)	1524	3.03	0.445 (0.271)	15.75 (3.10)	187 (86)	73 (23)	29.06 (98.41)
<b>50% of Pull at Reduced Engine Speed 11th (C3) Gear</b>									
55.94 (41.72)	4173 (18.56)	5.03 (8.09)	1541	1.89	0.483 (0.294)	14.53 (2.86)	181 (83)	74 (23)	29.05 (98.37)

### MAXIMUM POWER IN SELECTED GEARS

<b>6th (B2) Gear</b>									
92.79 (69.20)	10632 (47.29)	3.27 (5.27)	2145	12.41	0.512 (0.312)	13.70 (2.70)	189 (87)	68 (20)	29.08 (98.48)
<b>7th (B3) Gear</b>									
100.49 (74.94)	9265 (41.21)	4.07 (6.55)	2095	7.04	0.481 (0.292)	14.59 (2.87)	189 (87)	71 (22)	29.00 (98.21)
<b>8th (C1) Gear</b>									
101.86 (75.95)	8352 (37.15)	4.57 (7.36)	2094	5.23	0.474 (0.288)	14.80 (2.92)	188 (86)	71 (22)	29.00 (98.21)
<b>9th (B4) Gear</b>									
101.78 (75.90)	7420 (33.00)	5.14 (8.28)	2099	4.22	0.480 (0.292)	14.61 (2.88)	192 (89)	72 (22)	29.00 (98.21)
<b>10th (C2) Gear</b>									
103.07 (76.86)	6904 (30.71)	5.60 (9.01)	2097	3.91	0.473 (0.288)	14.83 (2.92)	192 (89)	73 (23)	29.01 (98.24)
<b>11th (C3) Gear</b>									
102.02 (76.08)	5640 (25.09)	6.78 (10.92)	2100	2.70	0.477 (0.290)	14.70 (2.90)	190 (88)	73 (23)	29.01 (98.24)
<b>12th (C4) Gear</b>									
98.90 (73.75)	4422 (19.67)	8.39 (13.50)	2102	1.97	0.493 (0.300)	14.25 (2.81)	191 (88)	72 (22)	29.01 (98.74)

## 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:	27.0 GPM	(102.2 l/min)
iii) Pump delivery rate at maximum		
hydraulic power:	24.6 GPM	(93.1 l/min)
Delivery pressure:	2570 psi	(177 bar)
Power:	36.9 HP	(27.5 kW)

### THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar)	2950 (203)
Location	lift cylinder
Hydraulic oil temperature °F (°C)	144 (62)
Location	hydraulic sump
Category	IIIN
Quick attach	No

#### SAE Static Test

system pressure — 2650 psi (182 bar)  
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.	9630	9558	9261	8595	7245
Lift force on frame (kN)	(42.8)	(42.5)	(41.2)	(38.2)	(32.2)

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	10953	10944	10629	9855	8397
Lift force one frame (kN)	(48.7)	(48.7)	(47.3)	(43.8)	(37.4)

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.	12177	12564	12177	11268	9549
Lift force on frame (kN)	(54.2)	(55.9)	(54.2)	(50.1)	(42.5)

#### ASAE Static Test

system pressure — 2860 psi (197 bar)  
lift cylinders 2 × 70 mm

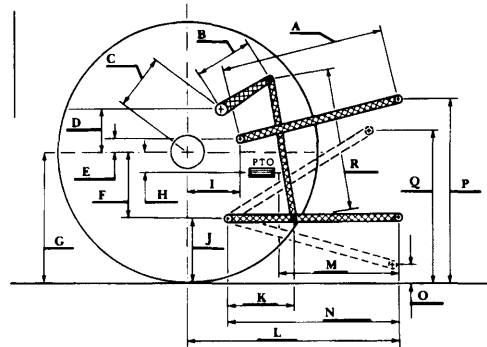
Hitch point distance to ground level in (mm)	7.9 (201)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	10514	10436	10111	9384	7910
Lift force on frame (kN)	(46.8)	(46.4)	(45.0)	(41.7)	(35.2)

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 one frame (kN)	(53.2)	(53.2)	(51.6)	(47.9)	(40.8)

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	34.2	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 7610 POWRQUAD DIESEL

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