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Test 1739: John Deere 7210 Powrquad Diesel 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1739—SUMMARY 239

JOHN DEERE 7210 POWRQUAD DIESEL

16 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
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1002 rpm)					
95.94 (71.54)	2100	5.77 (21.83)	0.423 (0.257)	16.64 (3.28)	
Maximum Power (2 hours)					
98.28 (73.29)	1800	5.47 (20.72)	0.392 (0.239)	17.95 (3.54)	

VARYING POWER AND FUEL CONSUMPTION

95.94 (71.54)	2100	5.77 (21.83)	0.423 (0.257)	16.64 (3.28)	Air temperature
84.55 (63.05)	2180	5.37 (20.32)	0.447 (0.272)	15.75 (3.10)	78°F (26°C)
64.28 (47.93)	2212	4.64 (17.58)	0.509 (0.309)	13.84 (2.73)	Relative humidity
43.68 (32.57)	2237	3.75 (14.19)	0.604 (0.368)	11.65 (2.30)	64%
22.08 (16.47)	2262	2.81 (10.64)	0.897 (0.545)	7.86 (1.55)	Barometer
1.04 (0.77)	2283	2.00 (7.58)	13.601 (8.273)	0.52 (0.10)	28.84" Hg (97.66 kPa)

Maximum Torque 332 lb.-ft. (450 Nm) at 1301 rpm

Maximum Torque Rise 38.3%

Torque rise at 1700 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)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—7th (B3) Gear									
84.71 (63.17)	6991 (31.10)	4.54 (7.31)	2098	3.94	0.474 (0.288)	14.87 (2.93)	192 (89)	66 (19)	29.18 (98.81)
75% of Pull at Maximum Power—7th (B3) Gear									
67.28 (50.17)	5244 (23.33)	4.81 (7.74)	2198	3.04	0.524 (0.319)	13.44 (2.65)	187 (86)	57 (14)	29.33 (99.32)
50% of Pull at Maximum Power—7th (B3) Gear									
45.96 (34.27)	3504 (15.59)	4.92 (7.92)	2227	2.13	0.620 (0.377)	11.35 (2.24)	186 (85)	60 (16)	29.31 (99.26)
75% of Pull at Reduced Engine Speed—10th (C2) Gear									
67.25 (50.15)	5239 (23.30)	4.81 (7.75)	1657	2.96	0.449 (0.273)	15.67 (3.09)	191 (88)	58 (14)	29.32 (99.29)
50% of Pull at Reduced Engine Speed—10th (C2) Gear									
45.97 (34.28)	3495 (15.55)	4.93 (7.94)	1683	2.05	0.515 (0.313)	13.68 (2.69)	185 (85)	60 (16)	29.31 (99.26)

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

Dates of Test: October 6-21, 1997

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

FUEL OIL and TIME: Fuel No. 2 Diesel Cetane
No. 53.9 Specific gravity converted to 60°/60°
F (15°/15°C) 0.8459 Fuel weight 7.043 lbs/gal
(0.844 kg/l) Oil SAE 15W-40 API service
classification CE, CG-4 To motor 4.995 gal
(18.909 l) Drained from motor 4.914 gal
(18.602 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 21.5
hours.

ENGINE: Make John Deere Diesel Type six
cylinder vertical with turbocharger Serial No.
TO6068T720071 Crankshaft lengthwise Rated
engine speed 2100 Bore and stroke (as specified)
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 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: 39.5-41.2 lb/h (17.9-18.7 kg/h) High idle:
2225-2325 rpm Turbo boost nominal 7.5-11.9 psi
(52-82 kPa) as measured 8.5 psi (58 kPa)

CHASSIS: Type front wheel assist Serial No.
RW7210H002212 Tread width rear 60.0" (1525
mm) to 100.3" (2548 mm) front 60.0" (1524 mm) to
88.0" (2235 mm) Wheel base 103.3" (2625 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 1.49 (2.40) second
1.81 (2.90) third 2.16 (3.47) fourth 2.64 (4.25) fifth
3.17 (5.10) sixth 3.83 (6.14) seventh 4.57 (7.35) eighth
5.04 (8.11) ninth 5.59 (9.00) tenth 6.07 (9.77) eleventh
7.26 (11.69) twelfth 8.90 (14.33) thirteenth 10.45
(16.81) fourteenth 12.58 (20.25) fifteenth 15.06 (24.25)
sixteenth 18.46 (29.71) reverse 1.76 (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 multiple wet disc
hydraulically actuated by foot pedal Brakes wet

**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	Barom. inch Hg (kPa)
3rd (A3) Gear							
68.43 (51.03)	12980 (57.74)	1.98 (3.18)	2184	14.90	0.550 (0.334)	186 (85)	29.20 (98.88)
4th (A4) Gear							
82.49 (61.51)	12353 (54.95)	2.50 (4.03)	2103	8.71	0.490 (0.298)	189 (87)	29.22 (98.95)
5th (B1) Gear							
85.51 (63.77)	10343 (46.01)	3.10 (4.99)	2101	5.53	0.473 (0.288)	189 (87)	29.24 (99.02)
6th (B2) Gear							
84.49 (63.00)	8415 (37.43)	3.76 (6.06)	2099	4.66	0.475 (0.289)	193 (89)	29.18 (98.81)
7th (B3) Gear							
84.71 (63.17)	6991 (31.10)	4.54 (7.31)	2098	3.94	0.474 (0.288)	192 (89)	29.18 (98.81)
8th (C1) Gear							
83.51 (62.27)	6195 (27.55)	5.06 (8.14)	2103	3.57	0.481 (0.292)	192 (89)	29.18 (98.81)
9th (B4) Gear							
81.67 (60.90)	5443 (24.21)	5.63 (9.06)	2097	2.96	0.492 (0.299)	191 (88)	29.18 (98.81)
10th (C2) Gear							
81.86 (61.04)	5016 (22.31)	6.12 (9.85)	2099	2.80	0.491 (0.299)	193 (89)	29.18 (98.81)
11th (C3) Gear							
81.12 (60.49)	4136 (18.40)	7.35 (11.84)	2097	2.30	0.493 (0.300)	190 (88)	29.18 (98.81)
12th (C4) Gear							
77.11 (57.50)	3187 (14.18)	9.07 (14.60)	2102	1.79	0.521 (0.317)	190 (88)	29.18 (98.81)

**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	Barom. inch Hg (kPa)
3rd (A3) Gear							
69.14 (51.56)	12922 (57.48)	2.01 (3.23)	2184	13.61	0.542 (0.329)	184 (84)	29.20 (98.88)
4th (A4) Gear							
82.75 (61.71)	12645 (56.25)	2.45 (3.95)	2081	9.50	0.488 (0.297)	190 (88)	29.21 (98.92)
5th (B1) Gear							
87.22 (65.04)	11323 (50.37)	2.89 (4.65)	1977	6.54	0.457 (0.278)	191 (88)	29.23 (98.98)
6th (B2) Gear							
87.10 (64.95)	10273 (45.69)	3.18 (5.12)	1801	6.15	0.440 (0.268)	193 (89)	29.18 (98.81)
7th (B3) Gear							
87.45 (65.21)	8479 (37.72)	3.87 (6.22)	1801	4.66	0.436 (0.265)	193 (89)	29.18 (98.81)
8th (C1) Gear							
87.35 (65.14)	7605 (33.83)	4.31 (6.93)	1806	4.18	0.438 (0.266)	193 (89)	29.18 (98.81)
9th (B4) Gear							
86.46 (64.48)	6752 (30.03)	4.80 (7.73)	1805	3.62	0.443 (0.270)	192 (89)	29.18 (98.81)
10th (C2) Gear							
86.76 (64.70)	6244 (27.77)	5.21 (8.39)	1799	3.46	0.441 (0.268)	193 (89)	29.18 (98.81)
11th (C3) Gear							
86.25 (64.32)	5137 (22.85)	6.30 (10.13)	1806	2.80	0.444 (0.270)	194 (90)	29.18 (98.81)
12th (C4) Gear							
83.33 (62.14)	4040 (17.97)	7.74 (12.45)	1799	2.30	0.459 (0.279)	194 (90)	29.18 (98.81)
13th (D1) Gear							
81.34 (60.65)	3351 (14.90)	9.10 (14.65)	1796	1.96	0.470 (0.286)	194 (90)	29.18 (98.81)

multiple disc hydraulically actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2080 engine rpm and 1000 rpm at 2093 engine rpm **Unladen tractor mass** 12785 lb (5798 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 159° F (71°C). This tractor did not meet manufacturers 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. **1739**, Summary 239, November 11, 1997.

LOUIS I. LEVITICUS
Engineer-in-Charge

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

DRAWBAR PERFORMANCE **(UNBALLASTED—FRONT DRIVE DISENGAGED)** **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)	
Maximum Power—7th (B3) Gear									
84.45 (62.97)	7096 (31.56)	4.46 (7.18)	2102	4.29	0.476 (0.290)	14.80 (2.91)	192 (89)	69 (21)	29.18 (98.81)
75% of Pull at Maximum Power—7th (B3) Gear									
67.33 (50.21)	5325 (23.68)	4.74 (7.63)	2199	2.76	0.516 (0.314)	13.65 (2.69)	186 (86)	57 (14)	29.33 (99.32)
50% of Pull at Maximum Power—7th (B3) Gear									
45.87 (34.21)	3550 (15.79)	4.85 (7.80)	2228	2.02	0.610 (0.371)	11.54 (2.27)	184 (84)	60 (16)	29.31 (99.26)
75% of Pull at Reduced Engine Speed—10th (C2) Gear									
67.22 (50.12)	5322 (23.67)	4.74 (7.62)	1655	2.68	0.443 (0.269)	15.91 (3.13)	190 (88)	59 (15)	29.31 (99.26)
50% of Pull at Reduced Engine Speed—10th (C2) Gear									
45.91 (34.24)	3528 (15.69)	4.88 (7.85)	1690	2.02	0.503 (0.306)	14.01 (2.76)	184 (84)	60 (16)	29.31 (99.26)

MAXIMUM POWER IN SELECTED GEARS

4th (A4) Gear									
69.96 (52.17)	11030 (49.06)	2.38 (3.83)	2176	14.64	0.557 (0.339)	12.64 (2.49)	186 (86)	59 (15)	20.23 (98.98)
5th (B1) Gear									
84.00 (62.64)	10449 (46.48)	3.01 (4.85)	2101	6.68	0.482 (0.293)	14.60 (2.88)	189 (87)	56 (13)	29.24 (99.02)
6th (B2) Gear									
84.03 (62.66)	8562 (38.09)	3.68 (5.92)	2099	5.46	0.477 (0.290)	14.76 (2.91)	192 (89)	68 (20)	29.18 (98.81)
7th (B3) Gear									
84.45 (62.97)	7096 (31.56)	4.46 (7.18)	2101	4.29	0.476 (0.290)	14.80 (2.91)	192 (89)	69 (21)	29.18 (98.81)
8th (C1) Gear									
84.27 (62.84)	6384 (28.40)	4.95 (7.97)	2098	3.65	0.476 (0.290)	14.78 (2.91)	191 (88)	66 (19)	29.18 (98.81)
9th (B4) Gear									
83.13 (61.99)	5654 (25.15)	5.51 (8.87)	2094	3.17	0.483 (0.294)	14.59 (2.87)	190 (88)	67 (19)	29.18 (98.81)
10th (C2) Gear									
83.05 (61.93)	5169 (22.99)	6.03 (9.70)	2104	2.85	0.482 (0.293)	14.63 (2.88)	190 (88)	66 (19)	29.18 (98.81)
11th (C3) Gear									
83.41 (62.20)	4330 (19.26)	7.22 (11.63)	2095	2.35	0.481 (0.292)	14.65 (2.89)	191 (88)	65 (18)	29.18 (98.81)
12th (C4) Gear									
80.26 (59.85)	3379 (15.03)	8.91 (14.33)	2099	2.02	0.499 (0.304)	14.11 (2.78)	191 (88)	65 (18)	29.18 (98.81)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At 75% load in 7th (B3) Gear	73.9	73.4
Bystander in 16th (D4) Gear	80.5	—

TIRES, BALLAST AND WEIGHT

Rear Tires—No., size, ply & psi (kPa)

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

Height of Drawbar

Static Weight with Operator—Rear

—Front

—Total

Tested Without Ballast

Two 18.4R38*; 16 (110)

Two 14.9R28***; 16 (110)

21.5 in (545 mm)

8424 lb (3821 kg)

4524 lb (2052 kg)

12948 lb (5873 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: none

Maximum Force Exerted Through Whole Range: 6858 lbs (30.5 kN)
7790 lbs (34.6 kN) with 80 mm lift cylinders

- i) Opening pressure of relief valve: NA
- Sustained pressure of the open relief valve: 2870 psi (198 bar)
- ii) Pump delivery rate at minimum pressure: 27.4 GPM (103.7 l/min)
- iii) Pump delivery rate at maximum hydraulic power: 25.5 GPM (96.5 l/min)
- Delivery pressure: 2520 psi (174 bar)
- Power: 37.5 HP (28.0 kW)

THREE POINT HITCH PERFORMANCE (SAE Static Test)

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

system pressure—2650 psi (182 bar)
lift cylinders—1 × 70 mm and 1 × 80 mm

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	10377	9369	8811	8217	7484
Lift force on frame (kN)	(46.2)	(41.7)	(39.2)	(36.6)	(33.3)

lift cylinders—2 × 80 mm

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
Lift force on frame (kN)	(52.6)	(47.9)	(45.1)	(41.8)	(38.2)

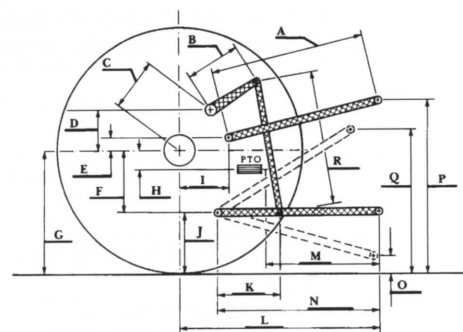
As per current SAE test procedures

system pressure—2860 psi (197 bar)
lift cylinders—1 × 70 mm and 1 × 80 mm

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	11178	10092	9491	8851	8061
Lift force on frame (kN)	(49.7)	(44.9)	(42.2)	(39.4)	(35.9)

lift cylinders—2 × 80 mm

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
Lift force on frame (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



JOHN DEERE 7210 POWRQUAD DIESEL

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