

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

January 1994

Test 1679: John Deere 7200 Powerquad Diesel 16-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Nebraska Tractor Test Lab, "Test 1679: John Deere 7200 Powerquad Diesel 16-Speed" (1994). *Nebraska Tractor Tests*. 1988.

<https://digitalcommons.unl.edu/tractormuseumlit/1988>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA OECD TRACTOR TEST 1679—SUMMARY 151
JOHN DEERE 7200 POWRQUAD DIESEL
16 SPEED

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

Dates of Test: May 11 to June 2, 1994

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)** 0.8400 **Fuel weight** 6.994 lbs/gal (0.838 kg/l) **Oil SAE** 15W-40 **API service classification** SG/CE **To motor** 4.462 gal (16.891 l) **Drained from motor** 4.378 gal (16.573 l) **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere GL-5 Gear Lubricant **Total time engine was operated** 19.0 hours.

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *TO6059T431870* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** (as specified) 4.19"×4.331" (106.5 mm×110.0 mm) **Compression ratio** 17.8 to 1 **Displacement** 359 cu in (5880 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:** 37.3-40.3 lb/h (16.9-18.3 kg/h) **High idle:** 2225-2325 rpm **Turbo boost** nominal 8.7-10.2 psi (60-70 kPa) as measured 9.0 psi (65 kPa)

CHASSIS: **Type** front wheel assist **Serial No.** *RW7200H001519* **Tread width** rear 60.0" (1524 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 (2.91) third 2.16 (3.47) fourth 2.64 (4.25) fifth 3.17 (5.10) sixth 3.83 (6.16) seventh 4.57 (7.35) eighth 5.04 (8.11) ninth 5.59 (9.00) tenth 6.09 (9.80) eleventh 7.26 (11.69) twelfth 8.90 (14.33) thirteenth 10.45 (16.81) fourteenth 12.63 (20.32) fifteenth 15.06 (24.24) sixteenth 18.46 (29.71) reverse 1.76 (2.84), 2.13 (3.43), 2.55 (4.10), 3.12 (5.02), 3.74 (6.02), 4.52 (7.28), 5.39 (8.68), 5.95 (9.58), 6.61 (10.64), 7.20 (11.58), 8.59 (13.82), 10.52 (16.93) **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 2080 engine rpm and 1000 rpm at 2093 engine rpm **Unladen tractor mass** 12678 lb (5751 kg)

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—1003 rpm)					
94.29 (70.31)	2100	5.50 (20.81)	0.408 (0.248)	17.16 (3.38)	
Maximum Power (2 hours)					
97.88 (72.99)	1900	5.44 (20.58)	0.388 (0.236)	18.00 (3.55)	

VARYING POWER AND FUEL CONSUMPTION

94.29 (70.31)	2100	5.50 (20.81)	0.408 (0.248)	17.16 (3.38)	Air temperature
84.19 (62.78)	2203	5.23 (19.81)	0.435 (0.264)	16.09 (3.17)	78°F (26°C)
63.90 (47.65)	2229	4.46 (16.89)	0.488 (0.297)	14.32 (2.82)	Relative humidity
42.98 (32.05)	2250	3.56 (13.48)	0.579 (0.352)	12.07 (2.38)	64%
21.87 (16.31)	2268	2.70 (10.23)	0.864 (0.526)	8.09 (1.59)	Barometer
0.83 (0.62)	2282	1.89 (7.14)	15.896 (9.670)	0.44 (0.09)	29.03" Hg (98.29 kPa)

Maximum Torque 311 lb.-ft. (421 Nm) at 1300 rpm
Maximum Torque Rise 31.6%
Torque rise at 1699 engine rpm 23%

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)
Maximum Power—7th (B3) Gear									
85.86 (64.03)	7130 (31.71)	4.52 (7.27)	2101	4.62	0.455 (0.277)	15.38 (3.03)	201 (94)	80 (27)	29.02 (98.27)
75% of Pull at Maximum Power—7th (B3) Gear									
68.58 (51.14)	5354 (23.82)	4.80 (7.73)	2206	3.33	0.500 (0.304)	14.00 (2.76)	195 (91)	84 (29)	28.97 (98.10)
50% of Pull at Maximum Power—7th (B3) Gear									
46.67 (34.80)	3569 (15.87)	4.90 (7.89)	2229	2.34	0.594 (0.361)	11.77 (2.32)	191 (88)	84 (29)	28.97 (98.10)
75% of Pull at Reduced Engine Speed—10th (C2) Gear									
68.43 (51.03)	5364 (23.86)	4.78 (7.70)	1654	3.33	0.446 (0.271)	15.70 (3.09)	199 (93)	84 (29)	28.97 (98.10)
50% of Pull at Reduced Engine Speed—10th (C2) Gear									
46.60 (34.75)	3578 (15.91)	4.88 (7.86)	1672	2.42	0.495 (0.301)	14.14 (2.78)	188 (87)	84 (29)	28.97 (98.10)

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/kW.h)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
66.76 (49.79)	12440 (55.34)	2.01 (3.24)	2214	14.39	3rd (A3) Gear 0.538 (0.327)	13.00 (2.56)	190 (88)	68 (20)	29.00 (98.21)
77.83 (58.04)	11503 (51.17)	2.54 (4.08)	2180	10.79	4th (A4) Gear 0.500 (0.304)	14.00 (2.76)	194 (90)	74 (23)	29.00 (98.21)
84.60 (63.08)	10677 (47.49)	2.97 (4.78)	2065	7.70	5th (B1) Gear 0.458 (0.279)	15.27 (3.01)	198 (92)	71 (22)	29.00 (98.21)
85.25 (63.57)	9447 (42.02)	3.38 (5.45)	1930	6.64	6th (B2) Gear 0.443 (0.270)	15.78 (3.11)	201 (94)	80 (27)	29.00 (98.21)
86.45 (64.46)	7979 (35.49)	4.06 (6.54)	1902	5.09	7th (B3) Gear 0.437 (0.266)	16.00 (3.15)	202 (94)	80 (27)	29.01 (98.24)
86.36 (64.40)	7166 (31.88)	4.52 (7.27)	1904	4.46	8th (C1) Gear 0.440 (0.268)	15.89 (3.13)	204 (95)	80 (27)	29.01 (98.24)
84.98 (63.37)	6327 (28.14)	5.04 (8.11)	1901	3.98	9th (B4) Gear 0.443 (0.269)	15.81 (3.11)	202 (94)	82 (28)	29.00 (98.21)
85.35 (63.65)	5831 (25.94)	5.49 (8.83)	1904	3.66	10th (C2) Gear 0.442 (0.269)	15.83 (3.12)	202 (94)	83 (28)	29.00 (98.21)
84.24 (62.81)	4783 (21.28)	6.60 (10.63)	1901	3.09	11th (C3) Gear 0.448 (0.272)	15.61 (3.08)	203 (95)	83 (28)	28.99 (98.17)
81.42 (60.71)	3755 (16.70)	8.13 (13.09)	1898	2.42	12th (C4) Gear 0.461 (0.281)	15.16 (2.99)	202 (94)	84 (29)	28.98 (98.14)

DRAWBAR PERFORMANCE AT 2100 RPM (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)
66.20 (49.37)	12368 (55.02)	2.01 (3.23)	2215	14.65	3rd (A3) Gear 0.541 (0.329)	12.94 (2.55)	190 (88)	68 (20)	29.00 (98.21)
77.23 (57.59)	11439 (50.88)	2.53 (4.08)	2187	10.99	4th (A4) Gear 0.503 (0.306)	13.90 (2.74)	192 (89)	74 (23)	29.00 (98.21)
85.15 (63.50)	10541 (46.89)	3.03 (4.88)	2099	7.47	5th (B1) Gear 0.460 (0.280)	15.20 (2.99)	198 (92)	73 (23)	29.00 (98.21)
85.17 (63.51)	8578 (38.15)	3.72 (5.99)	2100	5.80	6th (B2) Gear 0.458 (0.278)	15.29 (3.01)	199 (93)	78 (26)	29.00 (98.21)
85.86 (64.03)	7130 (31.71)	4.52 (7.27)	2101	4.62	7th (B3) Gear 0.455 (0.277)	15.38 (3.03)	201 (94)	80 (27)	29.02 (98.27)
85.69 (63.90)	6413 (28.53)	5.01 (8.06)	2100	3.98	8th (C1) Gear 0.457 (0.278)	15.30 (3.01)	201 (94)	80 (27)	29.01 (98.24)
84.74 (63.19)	5681 (25.27)	5.59 (9.00)	2102	3.49	9th (B4) Gear 0.463 (0.282)	15.11 (2.98)	201 (94)	81 (27)	29.01 (98.24)
85.09 (63.45)	5248 (23.34)	6.08 (9.78)	2101	3.33	10th (C2) Gear 0.460 (0.280)	15.22 (3.00)	201 (94)	83 (28)	29.00 (98.21)
83.41 (62.20)	4271 (19.00)	7.32 (11.79)	2101	2.84	11th (C3) Gear 0.468 (0.285)	14.94 (2.94)	202 (94)	83 (29)	28.99 (98.17)
80.48 (60.01)	3343 (14.87)	9.03 (14.53)	2102	2.17	12th (C4) Gear 0.488 (0.297)	14.35 (2.83)	203 (95)	84 (29)	28.98 (98.14)

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 158° F (70°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. **1679**, Summary 151, July 21, 1994.

LOUIS I. LEVITICUS
Engineer-in-Charge

R.D. GRISSO
M.F. KOCHER
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		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	
Maximum Power—8th (C1) Gear									
86.49 (64.49)	6597 (29.34)	4.92 (7.91)	2100	4.40	0.454 (0.276)	15.41 (3.04)	202 (94)	80 (27)	29.01 (98.24)
75% of Pull at Maximum Power—8th (C1) Gear									
69.21 (51.61)	4951 (22.02)	5.24 (8.44)	2209	3.20	0.500 (0.304)	13.99 (2.76)	196 (91)	84 (29)	28.97 (98.10)
50% of Pull at Maximum Power—8th (C1) Gear									
47.23 (35.22)	3301 (14.68)	5.36 (8.63)	2237	2.06	0.590 (0.359)	11.86 (2.34)	190 (88)	84 (29)	28.97 (98.10)
75% of Pull at Reduced Engine Speed—11th (C3) Gear									
69.21 (51.61)	4950 (22.02)	5.24 (8.44)	1532	3.20	0.438 (0.266)	15.98 (3.15)	200 (93)	84 (29)	28.97 (98.10)
50% of Pull at Reduced Engine Speed—11th (C3) Gear									
47.30 (35.27)	3308 (14.71)	5.36 (8.63)	1550	2.06	0.472 (0.287)	14.83 (2.92)	188 (87)	84 (29)	28.97 (98.10)

MAXIMUM POWER IN SELECTED GEARS

5th (B1) Gear									
75.93 (56.62)	9871 (43.91)	2.88 (4.64)	2188	14.21	0.514 (0.313)	13.60 (2.68)	193 (89)	70 (21)	29.00 (98.21)
6th (B2) Gear									
84.20 (62.79)	8849 (39.36)	3.57 (5.74)	2098	8.18	0.464 (0.282)	15.07 (2.97)	197 (91)	77 (25)	29.00 (98.21)
7th (B3) Gear									
85.88 (64.04)	7276 (32.36)	4.43 (7.12)	2102	5.18	0.455 (0.277)	15.38 (3.03)	200 (93)	80 (27)	29.02 (98.27)
8th (C1) Gear									
86.49 (64.49)	6597 (29.34)	4.92 (7.91)	2100	4.40	0.454 (0.276)	15.41 (3.04)	202 (94)	80 (27)	29.01 (98.24)
9th (B4) Gear									
86.11 (64.21)	5875 (26.13)	5.50 (8.85)	2100	3.76	0.457 (0.278)	15.31 (3.02)	202 (94)	81 (27)	29.01 (98.24)
10th (C2) Gear									
85.93 (64.08)	5387 (23.96)	5.98 (9.63)	2100	3.36	0.454 (0.276)	15.42 (3.04)	202 (94)	83 (28)	29.00 (98.21)
11th (C3) Gear									
85.26 (63.58)	4431 (19.71)	7.22 (11.61)	2101	2.80	0.458 (0.279)	15.26 (3.01)	202 (94)	83 (28)	28.99 (98.17)
12th (C4) Gear									
83.39 (62.19)	3516 (15.64)	8.89 (14.31)	2102	2.22	0.470 (0.286)	14.87 (2.93)	201 (94)	84 (29)	28.98 (98.14)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At 75% load in 9th (B4) Gear	73.5	74.0
Bystander in 16th (D4) Gear	83.5	—

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 13.6R28:***, 24 (165)
- 21.5 in (545 mm)
- 8422 lb (3820 kg)
- 4422 lb (2006 kg)
- 12844 lb (5826 kg)

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				

With 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)

With 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)

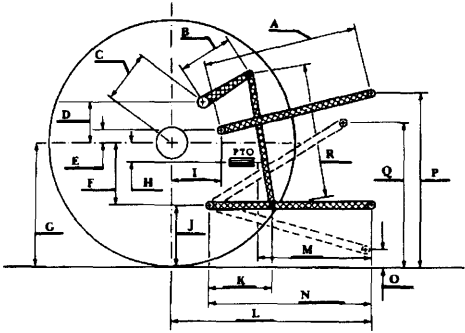
THREE POINT HITCH PERFORMANCE (OECD Static Test)

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 with pump stalled: 2850 psi (197 bar)
- ii) Pump delivery rate at minimum pressure and rated engine speed: 26.2 GPM (99.2 l/min)
- iii) Pump delivery rate at maximum hydraulic power: 24.3 GPM (92.0 l/min)
Delivery pressure: 2550 psi (176 bar)
Power: 36.2 HP (29.7 kW)



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 7200 POWRQUAD DIESEL

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director