

# NEBRASKA OECD TRACTOR TEST 1774—SUMMARY 309

## JOHN DEERE 8210T DIESEL

### 16 SPEED

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

**Dates of Test:** April 24-May 17, 2000

**Manufacturer:** John Deere Waterloo Works, P.O. Box 270, Waterloo Ia, USA, 50704

**FUEL, OIL and TIME:** Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8487 Fuel weight 7.067 lbs/gal (0.847 kg/l) Oil SAE 15W-40 API service classification CF-4 Transmission and hydraulic lubricant John Deere Hy-Gard fluid Total time engine was operated: 29.5 hours

**ENGINE:** Make John Deere Diesel Type six cylinder vertical with turbocharger and air to air aftercooler Serial No. \*RG6081H098352\* Crankshaft lengthwise Rated engine speed 2200 Bore and stroke 4.56" x 5.06"(115.8 mm x 128.5 mm) Compression ratio 16.5 to 1 Displacement 496 cu in (8134 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements and aspirator Oil filter one full flow cartridge Oilcooler engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil Fuel filter one paper element and prestrainer Fuel cooler radiator for pump return fuel Muffler vertical Cooling medium temperature control 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS:** Fuel rate: 73.0 - 80.5 lb/h (33.1 - 36.5 kg/h) High idle: 2275 - 2325 rpm Turbo boost: nominal 16.1 - 20.5 psi (111 - 141 kPa) as measured 19.0 psi (131 kPa)

**CHASSIS:** Type tracklayer-rubber tracked Serial No. \*RW8210T901069\* Track width 88.0" (2235 mm) to 119.5 (3035 mm) Length of track on ground 89.0" (2261 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio with full range operator controlled power shift Nominal travel speeds mph (km/h) first 1.16 (1.87) second 1.49 (2.39) third 1.89 (3.04) fourth 2.41 (3.88) fifth 2.92 (4.70) sixth 3.30 (5.31) seventh 3.73 (6.01) eighth 4.21 (6.78) ninth 4.75 (7.65) tenth 5.36 (8.63) eleventh 6.07 (9.77) twelfth 6.85 (11.02) thirteenth 8.71 (14.02) fourteenth 11.13 (17.91) fifteenth 14.17 (22.80) sixteenth 18.10 (29.13) reverse 1.01 (1.63), 2.55 (4.10), 2.88 (4.63), 5.53 (8.90) @ 1600 engine rpm Clutch wet multiple disc hydraulically actuated by foot pedal Brakes wet multiple disc hydraulically actuated foot pedal Steering electro-hydraulic differential steering controlled by steering wheel Power take-off 1000 rpm at 2179 engine rpm Unladen tractor mass 25390 lb (11517 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
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed—(PTO speed—1009 rpm)</b>					
188.13 (140.29)	2200	10.95 (41.45)	0.411 (0.250)	17.18 (3.38)	
<b>Maximum Power (2 hours)</b>					
216.32 (161.31)	2000	11.66 (44.16)	0.381 (0.232)	18.54 (3.65)	
<b>VARYING POWER AND FUEL CONSUMPTION</b>					
188.13 (140.29)	2200	10.95 (41.45)	0.411 (0.250)	17.18 (3.38)	Air temperature
164.39 (122.58)	2253	10.06 (38.08)	0.433 (0.263)	16.34 (3.22)	77°F (25°C)
123.52 (92.11)	2263	8.28 (31.34)	0.474 (0.288)	14.92 (2.94)	Relative humidity
82.73 (61.69)	2271	6.54 (24.75)	0.558 (0.340)	12.66 (2.49)	42%
41.46 (30.92)	2282	4.63 (17.52)	0.789 (0.480)	8.96 (1.77)	Barometer
2.50 (1.86)	2290	3.01 (11.41)	8.523 (5.185)	0.83 (0.16)	28.91" Hg (97.90 kPa)
Maximum Torque - 663 lb.-ft. (898 Nm) at 1200 rpm					
Maximum Torque Rise - 47.5%					
Torque rise at 1800 engine rpm - 36%					

#### DRAWBAR PERFORMANCE(Unballasted) 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 cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—9th Gear</b>									
158.81 (118.43)	12833 (57.08)	4.64 (7.47)	2195	2.04	0.483 (0.294)	14.63 (2.88)	196 (91)	66 (19)	28.67 (97.09)
<b>75% of Pull at Maximum Power—9th Gear</b>									
123.32 (91.96)	9609 (42.74)	4.81 (7.75)	2258	1.18	0.534 (0.325)	13.24 (2.61)	191 (88)	72 (22)	28.66 (97.05)
<b>50% of Pull at Maximum Power—9th Gear</b>									
82.88 (61.80)	6407 (28.50)	4.85 (7.81)	2267	0.95	0.634 (0.385)	11.15 (2.20)	186 (85)	76 (24)	28.64 (96.99)
<b>75% of Pull at Reduced Engine Speed—11th Gear</b>									
123.26 (91.91)	9622 (42.80)	4.80 (7.73)	1766	1.26	0.461 (0.280)	15.33 (3.02)	194 (90)	74 (23)	28.65 (97.02)
<b>50% of Pull at Reduced Engine Speed—11th Gear</b>									
82.84 (61.78)	6392 (28.43)	4.86 (7.82)	1779	0.79	0.527 (0.320)	13.42 (2.64)	187 (86)	76 (24)	28.62 (96.92)

**DRAWBAR PERFORMANCE(Unballasted)**

**MAXIMUM POWER IN SELECTED GEARS**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crankshaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kWh)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cooling med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
108.70 (81.05)	24479 (108.89)	1.67 (2.68)	2255	13.87	0.591 (0.360)	11.95 (2.35)	186 (85)	62 (17)	28.95 (98.04)
4th Gear									
128.72 (95.99)	23422 (104.18)	2.06 (3.32)	2159	12.78	0.545 (0.332)	12.96 (2.55)	188 (86)	62 (17)	28.70 (97.19)
5th Gear									
153.39 (114.39)	22968 (102.16)	2.50 (4.03)	2137	11.55	0.514 (0.313)	13.75 (2.71)	195 (90)	64 (18)	28.70 (97.19)
6th Gear									
163.54 (121.95)	22979 (102.21)	2.67 (4.30)	2039	12.48	0.500 (0.304)	14.14 (2.79)	190 (88)	64 (18)	28.69 (97.16)
7th Gear									
174.94 (130.45)	21059 (93.68)	3.12 (5.01)	2001	8.10	0.468 (0.285)	15.09 (2.97)	193 (89)	65 (18)	28.69 (97.16)
8th Gear									
179.84 (134.11)	18592 (82.70)	3.63 (5.84)	2001	5.24	0.455 (0.277)	15.54 (3.06)	196 (91)	65 (18)	28.68 (97.12)
9th Gear									
182.73 (136.26)	16486 (73.33)	4.16 (6.69)	1999	3.63	0.448 (0.272)	15.78 (3.11)	197 (91)	65 (18)	28.67 (97.09)
10th Gear									
183.71 (137.00)	14537 (64.66)	4.74 (7.63)	2000	2.57	0.447 (0.272)	15.82 (3.12)	197 (92)	67 (19)	28.66 (97.05)
11th Gear									
183.33 (136.71)	12738 (56.66)	5.40 (8.69)	1997	1.96	0.448 (0.272)	15.79 (3.11)	197 (91)	69 (21)	28.66 (97.05)
12th Gear									
182.43 (136.04)	11169 (49.68)	6.13 (9.86)	1999	1.50	0.450 (0.274)	15.69 (3.09)	200 (93)	70 (21)	28.66 (97.05)
13th Gear									
179.08 (133.54)	8561 (38.08)	7.84 (12.63)	2003	1.03	0.460 (0.280)	15.35 (3.02)	200 (93)	71 (22)	28.66 (97.05)

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**NOTE:** The 8210T engine has an electronic control system which provides a vehicle protection system to avoid overloading the drive train. This system provides two different engine power levels. The engine produces up to 165 PTO hp when the transmission is in forward gears 1 through 4 and the PTO is not engaged. The engine produces up to 185 PTO Hp in all other applications.

**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 117°F(47°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. **1774**, Nebraska Summary 309, July 7, 2000.

Leonard L. Bashford  
Director

G. J. Hoffman  
M. F. Kocher  
R. D. Grisso Jr.  
Board of Tractor Test Engineers

**TRACTOR SOUND LEVEL WITH CAB**

**dB(A)**

At no load in 9th gear	76.6
Transport speed - no load - 16th gear	79.2
Bystander in 16th Gear	89.7

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
Track width	16.0 in (406 mm)	16.0 in (406 mm)
Ballast - Cast iron(front)	2045 lb (928 kg)	None
Height of Drawbar	18.5 in (470 mm)	18.5 in (470 mm)
Static Weight with operator	27610 lb(12524 kg)	25565 lb(11596 kg)

**DRAWBAR PERFORMANCE**  
**(Ballasted - 2000 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)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
3rd Gear									
115.70 (86.28)	26168 (116.40)	1.66 (2.67)	2251	14.27	0.582 (0.354)	12.15 (2.39)	189 (87)	62 (17)	28.65 (97.02)
4th Gear									
140.02 (104.41)	24890 (110.71)	2.11 (3.40)	2118	9.28	0.508 (0.309)	13.90 (2.74)	192 (89)	60 (16)	28.67 (97.09)
5th Gear									
163.28 (121.76)	24575 (109.31)	2.49 (4.01)	2086	10.13	0.493 (0.300)	14.33 (2.82)	189 (87)	61 (16)	28.68 (97.12)
6th Gear									
174.28 (129.96)	23825 (105.98)	2.74 (4.41)	2001	8.68	0.470 (0.286)	15.02 (2.96)	197 (91)	62 (17)	28.69 (97.16)
7th Gear									
180.06 (134.27)	21161 (94.13)	3.19 (5.14)	2000	6.07	0.455 (0.277)	15.54 (3.06)	199 (93)	62 (17)	28.69 (97.16)
8th Gear									
183.35 (136.72)	18709 (83.22)	3.68 (5.91)	2000	4.11	0.447 (0.272)	15.82 (3.12)	197 (92)	64 (18)	28.70 (97.19)
9th Gear									
184.86 (137.85)	16543 (73.59)	4.19 (6.74)	2000	3.14	0.444 (0.270)	15.92 (3.14)	201 (94)	64 (18)	28.70 (97.19)
10th Gear									
184.94 (137.91)	14557 (64.75)	4.76 (7.67)	2001	2.46	0.445 (0.271)	15.89 (3.13)	196 (91)	66 (19)	28.72 (97.26)
11th Gear									
183.77 (137.04)	12736 (56.65)	5.41 (8.71)	1997	1.84	0.448 (0.272)	15.78 (3.11)	197 (91)	66 (19)	28.72 (97.26)
12th Gear									
182.70 (136.24)	11145 (49.57)	6.15 (9.89)	2004	1.53	0.449 (0.273)	15.72 (3.10)	197 (92)	67 (19)	28.72 (97.26)
13th Gear									
178.38 (133.02)	8531 (37.95)	7.84 (12.62)	1999	1.14	0.460 (0.280)	15.38 (3.03)	199 (93)	68 (20)	28.73 (97.29)

**DRAWBAR PERFORMANCE**  
**(Ballasted - 2200 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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
117.11 (87.33)	26230 (116.68)	1.67 (2.69)	2251	13.41	0.575 (0.349)	12.30 (2.42)	188 (87)	62 (17)	28.65 (97.02)
4th Gear									
135.21 (100.83)	22325 (99.31)	2.27 (3.66)	2203	6.14	0.512 (0.311)	13.81 (2.72)	193 (89)	61 (16)	28.66 (97.05)
5th Gear									
157.35 (117.34)	21357 (95.00)	2.76 (4.45)	2199	5.57	0.488 (0.297)	14.49 (2.85)	190 (88)	60 (16)	28.67 (97.09)
6th Gear									
158.26 (118.02)	18752 (83.41)	3.16 (5.09)	2202	4.26	0.486 (0.295)	14.55 (2.87)	191 (88)	62 (17)	28.69 (97.16)
7th Gear									
160.65 (119.80)	16685 (74.22)	3.61 (5.81)	2196	3.14	0.478 (0.291)	14.78 (2.91)	196 (91)	63 (17)	28.69 (97.16)
8th Gear									
160.47 (119.66)	14595 (64.92)	4.12 (6.64)	2202	2.23	0.478 (0.290)	14.80 (2.92)	195 (91)	63 (17)	28.70 (97.19)
9th Gear									
160.01 (119.32)	12849 (57.15)	4.67 (7.52)	2202	1.92	0.479 (0.292)	14.75 (2.90)	198 (92)	64 (18)	28.71 (97.22)
10th Gear									
158.21 (117.98)	11215 (49.88)	5.29 (8.51)	2202	1.69	0.487 (0.296)	14.50 (2.86)	195 (90)	65 (18)	28.72 (97.26)
11th Gear									
156.02 (116.35)	9753 (43.38)	6.00 (9.65)	2200	1.22	0.493 (0.300)	14.33 (2.82)	196 (91)	66 (19)	28.72 (97.26)
12th Gear									
153.06 (114.14)	8470 (37.68)	6.78 (10.91)	2199	1.06	0.503 (0.306)	14.06 (2.77)	196 (91)	67 (19)	28.72 (97.26)
13th Gear									
148.28 (110.57)	6430 (28.60)	8.65 (13.92)	2200	0.83	0.520 (0.317)	13.58 (2.67)	198 (92)	69 (21)	28.73 (97.29)

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

CATEGORY: III

Quick Attach: yes

Maximum Force Exerted Through Whole Range: 15749 lbs (70.1 kN)

i) Opening pressure of relief valve: NA

Sustained pressure at compensator cutoff:	2900 psi (200 bar)	<u>High flow option</u> 2940 psi (203 bar)
	<b>two outlet sets combined</b>	

ii) Pump delivery rate at minimum pressure and rated engine speed:	34.7 GPM(131.4 l/min)	43.3 GPM(163.9 l/min)
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iii) Pump delivery rate at maximum hydraulic power:	32.8 GPM(124.2 l/min)	41.0 GPM(155.2 l/min)
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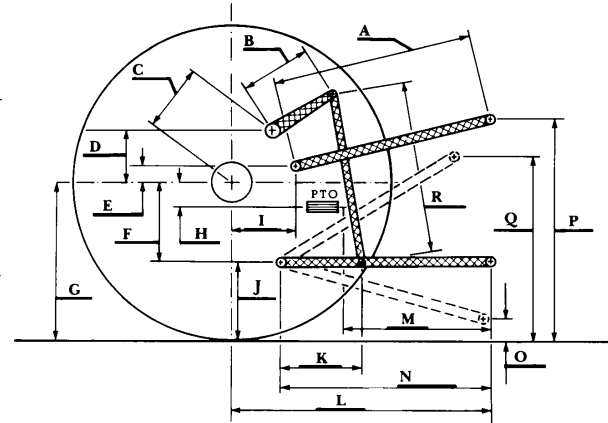
Delivery pressure:	2540 psi (175 bar)	2370 psi (163 bar)
Power:	48.6 HP (36.2 kW)	56.7 HP (42.3 kW)

#### single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed:	31.4 GPM(118.9 l/min)	31.2 GPM(118.1 l/min)
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iii) Pump delivery rate at maximum hydraulic power:	29.9 GPM(113.2 l/min)	28.2 GPM(106.7 l/min)
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Delivery pressure:	2200 psi (152 bar)	2230 psi (154 bar)
Power:	38.4 HP (28.6 kW)	36.7 HP (27.4 kW)



### THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar):	2890 (199)
Location:	lift cylinder
Hydraulic oil temperature: °F (°C):	148 (64)
Location:	hydraulic sump
Category:	III
Quick attach:	yes

#### SAE Static Test—System pressure 2575 psi (177 Bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	16.1 (408)	24.1 (613)	32.1 (814)	40.0 (1016)
Lift force on frame lb	15904	15964	16354	16348	15410
" " " " " " (kN)	(70.7)	(71.0)	(72.8)	(72.7)	(68.6)

#### ASAE Static Test—System pressure 2850 psi (196 Bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	16.1 (408)	24.1 (613)	32.1 (814)	40.0 (1016)
Lift force on frame lb	17671	17634	18059	18053	16981
" " " " " " (kN)	(78.6)	(78.4)	(80.3)	(80.3)	(52.7)

### HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.9	733
B	19.5	495
C	22.9	582
D	22.2	565
E	10.2	260
F	11.0	280
G	33.6	853
H	3.2	81
I	15.6	395
J	22.6	573
K	28.3	718
L	48.5	1231
*L'	52.0	1320
M	25.5	647
N	41.6	1056
O	8.0	203
P	40.8	1037
Q	39.1	993
R	42.9	1089

\*L' to Quick Attach ends



**JOHN DEERE 8210T DIESEL**

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