

# NEBRASKA OECD TRACTOR TEST 1800-SUMMARY 366

## JOHN DEERE 8420 DIESEL

### 16 SPEED

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

**Dates of Test:** May 7 - 31, 2002

**Manufacturer:** John Deere Tractor Works, 3500 East Donald St., P.O. Box 270, Waterloo Ia, 50704-0270

**FUEL, OIL and TIME:** Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8457 Fuel weight 7.042 lbs/gal (0.844 kg/l) Oil SAE 15W-40 API service classification CH-4 Transmission and hydraulic lubricant John Deere Hy-Gard fluid Front axle lubricant John Deere Hy-Gard fluid Total time engine was operated: 24.0 hours

#### 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>					
235.45 (175.58)	2200	13.66 (51.69)	0.409 (0.249)	17.24 (3.40)	
<b>Maximum Power (2 hours)</b>					
269.41 (200.90)	2000	14.47 (54.77)	0.378 (0.230)	18.62 (3.67)	

#### VARYING POWER AND FUEL CONSUMPTION

235.45 (175.58)	2200	13.66 (51.69)	0.409 (0.249)	17.24 (3.40)	Air temperature
205.04 (152.90)	2254	12.35 (46.75)	0.424 (0.258)	16.60 (3.27)	77°F (25°C)
154.80 (115.43)	2265	9.92 (37.56)	0.452 (0.275)	15.60 (3.07)	Relative humidity
103.27 (77.00)	2275	7.62 (28.85)	0.520 (0.316)	13.55 (2.67)	56%
51.88 (38.69)	2285	5.07 (19.18)	0.688 (0.419)	10.24 (2.02)	Barometer
1.00 (0.75)	2294	2.98 (11.28)	20.969 (12.755)	0.34 (0.07)	28.75" Hg (97.36 kPa)

Maximum Torque - 823 lb.-ft. (1116 Nm) at 1200 rpm

Maximum Torque Rise - 46.6%

Torque rise at 1800 engine rpm - 32%

#### 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 cool- ing med	°C Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power 8th Gear</b>									
207.49 (154.73)	16312 (72.56)	4.77 (7.68)	2201	3.87	0.462 (0.281)	15.23 (3.00)	196 (91)	61 (16)	29.09 (98.51)
<b>75% of Pull at Maximum Power 8th Gear</b>									
161.32 (120.30)	12215 (54.33)	4.95 (7.97)	2258	2.90	0.496 (0.302)	14.20 (2.80)	196 (91)	70 (21)	29.07 (98.44)
<b>50% of Pull at Maximum Power 8th Gear</b>									
109.27 (81.48)	8155 (36.28)	5.02 (8.09)	2271	1.92	0.575 (0.350)	12.24 (2.41)	184 (84)	71 (22)	29.07 (98.44)
<b>75% of Pull at Reduced Engine Speed 10th Gear</b>									
161.35 (120.32)	12221 (54.36)	4.95 (7.97)	1696	2.90	0.424 (0.258)	16.60 (3.27)	194 (90)	70 (21)	29.07 (98.44)
<b>50% of Pull at Reduced Engine Speed 10th Gear</b>									
109.42 (81.60)	8155 (36.27)	5.03 (8.10)	1708	1.92	0.469 (0.285)	15.03 (2.96)	184 (84)	71 (22)	29.06 (98.41)

**ENGINE:** Make John Deere Diesel Type six cylinder vertical with turbocharger and air to air aftercooler Serial No.\*RG6081H204589\* 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 Oil cooler engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil Fuel filter one paper element and water separator Fuel cooler radiator for pump inlet fuel Muffler vertical Cooling medium temperature control 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS:** Fuel rate: 90.5 - 98.0. lb/h (41.0 - 44.5 kg/h) High idle: 2275 - 2325 rpm Turbo boost: nominal 26.1 - 29.0 psi (180 - 200 kPa) as measured 28.0 psi (193 kPa)

**CHASSIS:** Type front wheel assist Serial No.\*RW8420P001742\* Tread width rear 60.0" (1524 mm) to 130.6 (3318 mm) front 60.0" (1524 mm) to 88.0" (2234 mm) Wheelbase 116.1" (2950 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 1.19 (1.91) second 1.59 (2.56) third 2.11 (3.40) fourth 2.84 (4.57) fifth 3.18 (5.12) sixth 3.67 (5.90) seventh 4.26 (6.85) eighth 4.92 (7.91) ninth 5.67 (9.12) tenth 6.54 (10.52) eleventh 7.59 (12.22) twelfth 8.76 (14.09) thirteenth 10.32 (16.61) fourteenth 13.82 (22.24) fifteenth 18.40 (29.61) sixteenth 24.03 (38.67) reverse 1.11 (1.79), 2.98 (4.79), 3.74 (6.02), 6.58 (10.59) @ 1500 engine rpm Clutch wet multiple disc hydraulically actuated by foot pedal Brakes wet multiple disc hydraulically operated by two foot pedals that can be locked together Steering hydrostatic Power take-off 1 3/4" shaft - 1000 rpm at 2179 engine rpm, (optional 1 3/8" shaft, 540 rpm at 1978 engine rpm or 1000 rpm at 2179 engine rpm) Unladen tractor mass 23780 lb (10786 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - 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)
5th Gear									
191.11 (142.51)	24276 (107.98)	2.95 (4.75)	2249	10.20	0.498 (0.303)	14.14 (2.78)	188 (87)	47 (8)	29.06 (98.41)
6th Gear									
200.33 (149.38)	21766 (96.82)	3.45 (5.55)	2201	6.74	0.478 (0.291)	14.75 (2.91)	191 (88)	51 (11)	29.08 (98.48)
7th Gear									
205.12 (152.96)	18773 (83.51)	4.10 (6.59)	2201	4.90	0.467 (0.284)	15.08 (2.97)	194 (90)	56 (13)	29.09 (98.51)
8th Gear									
207.49 (154.73)	16312 (72.56)	4.77 (7.68)	2201	3.87	0.462 (0.281)	15.23 (3.00)	196 (91)	61 (16)	29.09 (98.51)
9th Gear									
206.97 (154.34)	13990 (62.23)	5.55 (8.93)	2201	3.26	0.461 (0.281)	15.27 (3.01)	199 (93)	67 (19)	29.08 (98.48)
10th Gear									
205.63 (153.34)	12008 (53.41)	6.42 (10.33)	2198	2.73	0.467 (0.284)	15.10 (2.97)	198 (92)	67 (19)	29.08 (98.48)
11th Gear									
202.79 (151.22)	10155 (45.17)	7.49 (12.05)	2197	2.19	0.472 (0.287)	14.93 (2.94)	200 (93)	68 (20)	29.08 (98.48)
12th Gear									
199.08 (148.45)	8600 (38.25)	8.68 (13.97)	2201	1.92	0.479 (0.291)	14.71 (2.90)	201 (94)	69 (21)	29.08 (98.48)

**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 inlet was maintained at 102°F (39°C). The pull in 5th gear was limited to avoid excessive tractor bouncing. 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. **1800**, Nebraska Summary 366, July 23, 2002.

Brent T. Sampson  
 Test Engineer

L.L. Bashford  
 G.J. Hoffman  
 V.I. Adamchuk  
 Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 8th gear	72.1	72.4
Transport speed-no load-16th gear		77.3
Bystander in 16th Gear		86.1

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Four 480/80R46;***;14(95)	Four 480/80R46;***;10(70)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	4115 lb (1867 kg)	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Two 380/85R34;***;23(160)	Two 380/85R34;***;23(160)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	None	None
<b>Height of Drawbar</b>	21.0 in (535 mm)	21.0 in (535 mm)
<b>Static Weight with operator</b> - Rear	18170 lb (8241 kg)	14055 lb (6375 kg)
- Front	9900 lb (4491 kg)	9900 lb (4491 kg)
- Total	28070 lb(12732 kg)	23955 lb(10866 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
5th Gear									
191.20 (142.58)	24299 (108.09)	2.95 (4.75)	2249	10.05	0.495 (0.301)	14.22 (2.80)	186 (85)	47 (8)	29.06 (98.41)
6th Gear									
200.48 (149.50)	22151 (98.53)	3.39 (5.46)	2182	7.54	0.477 (0.290)	14.76 (2.91)	192 (89)	54 (12)	29.09 (98.51)
7th Gear									
216.51 (161.45)	21363 (93.03)	3.80 (6.12)	2092	7.06	0.458 (0.279)	15.39 (3.03)	196 (91)	58 (14)	29.09 (98.51)
8th Gear									
228.72 (170.56)	20270 (90.16)	4.23 (6.81)	2003	6.24	0.442 (0.269)	15.96 (3.14)	201 (94)	63 (17)	29.08 (98.48)
9th Gear									
233.35 (174.01)	17583 (78.21)	4.98 (8.01)	2000	4.56	0.431 (0.262)	16.33 (3.22)	202 (94)	67 (19)	29.08 (98.48)
10th Gear									
233.87 (174.39)	15138 (67.34)	5.79 (9.32)	2000	3.52	0.428 (0.260)	16.47 (3.24)	196 (91)	68 (20)	29.08 (98.48)
11th Gear									
233.02 (173.77)	12890 (57.34)	6.78 (10.91)	2002	2.90	0.432 (0.263)	16.32 (3.22)	202 (94)	68 (20)	29.08 (98.48)
12th Gear									
230.34 (171.76)	11001 (48.93)	7.85 (12.64)	2001	2.46	0.436 (0.265)	16.17 (3.19)	204 (95)	69 (21)	29.08 (98.48)
13th Gear									
228.08 (170.08)	9202 (40.93)	9.30 (14.96)	2002	2.19	0.441 (0.268)	15.97 (3.15)	206 (97)	69 (21)	29.08 (98.48)

**DRAWBAR PERFORMANCE**  
**BALLASTED, Single front tires - 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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th Gear									
188.03 (140.21)	27380 (121.79)	2.58 (4.14)	2236	11.59	0.513 (0.312)	13.72 (2.70)	192 (89)	64 (18)	28.70 (97.19)
5th Gear									
195.10 (145.48)	26094 (116.07)	2.80 (4.51)	2152	10.77	0.494 (0.300)	14.26 (2.81)	197 (92)	64 (18)	28.71 (97.22)
6th Gear									
214.51 (159.96)	25176 (111.99)	3.20 (5.14)	2086	8.94	0.464 (0.282)	15.18 (2.99)	199 (93)	65 (18)	28.72 (97.26)
7th Gear									
228.00 (170.02)	23543 (104.72)	3.63 (5.84)	2000	7.03	0.443 (0.270)	15.89 (3.13)	201 (94)	64 (18)	28.74 (97.33)
8th Gear									
235.39 (175.53)	20598 (91.62)	4.29 (6.90)	1998	4.95	0.430 (0.261)	16.40 (3.23)	200 (93)	63 (17)	28.80 (97.53)
9th Gear									
236.32 (176.23)	17729 (78.86)	5.00 (8.04)	1998	4.00	0.429 (0.261)	16.43 (3.24)	204 (96)	63 (17)	28.83 (97.63)
10th Gear									
236.51 (176.36)	15260 (67.88)	5.81 (9.35)	2001	3.30	0.426 (0.259)	16.55 (3.26)	205 (96)	64 (18)	28.85 (97.70)
11th Gear									
234.29 (174.71)	12979 (57.73)	6.77 (10.89)	1995	2.77	0.430 (0.262)	16.38 (3.23)	205 (96)	65 (18)	28.86 (97.73)
12th Gear									
232.42 (173.32)	11122 (49.47)	7.84 (12.61)	1995	2.33	0.431 (0.262)	16.35 (3.22)	206 (96)	65 (18)	28.87 (97.77)
13th Gear									
229.78 (171.35)	9268 (41.22)	9.30 (14.96)	2000	1.97	0.440 (0.268)	16.01 (3.15)	206 (96)	66 (19)	28.88 (97.80)

**DRAWBAR PERFORMANCE**  
**BALLASTED, Dual front tires - 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									
149.07 (111.16)	29964 (133.28)	1.87 (3.00)	2256	15.00	0.560 (0.340)	12.59 (2.48)	184 (84)	53 (12)	29.09 (98.51)
4th Gear									
195.40 (145.71)	28558 (127.03)	2.57 (4.13)	2177	9.42	0.489 (0.298)	14.39 (2.84)	190 (88)	54 (12)	29.09 (98.51)
5th Gear									
208.76 (155.67)	27407 (121.91)	2.86 (4.60)	2129	8.32	0.467 (0.284)	15.07 (2.97)	195 (90)	56 (13)	29.09 (98.51)
6th Gear									
224.00 (167.04)	26268 (116.85)	3.20 (5.15)	2044	7.20	0.446 (0.271)	15.79 (3.11)	196 (91)	58 (14)	29.09 (98.51)
7th Gear									
232.02 (173.02)	23496 (104.51)	3.70 (5.96)	2003	5.46	0.436 (0.265)	16.17 (3.19)	201 (94)	59 (15)	29.09 (98.51)
8th Gear									
234.82 (175.10)	20404 (90.76)	4.32 (6.95)	1999	4.44	0.431 (0.262)	16.35 (3.22)	201 (94)	59 (15)	29.09 (98.51)
9th Gear									
233.60 (174.20)	17409 (77.44)	5.03 (8.10)	2001	3.58	0.432 (0.263)	16.30 (3.21)	201 (94)	60 (16)	29.09 (98.51)
10th Gear									
234.60 (174.94)	15086 (67.11)	5.83 (9.38)	2000	3.05	0.432 (0.263)	16.32 (3.21)	204 (96)	61 (16)	29.09 (98.51)
11th Gear									
231.40 (172.56)	12751 (56.72)	6.81 (10.95)	1998	2.51	0.436 (0.265)	16.15 (3.18)	205 (96)	63 (17)	29.09 (98.51)
12th Gear									
229.73 (171.31)	10934 (48.63)	7.88 (12.68)	1998	2.06	0.438 (0.267)	16.08 (3.17)	204 (95)	66 (19)	29.09 (98.51)
13th Gear									
225.80 (168.38)	9070 (40.34)	9.34 (15.03)	2002	1.79	0.448 (0.272)	15.74 (3.10)	205 (96)	66 (19)	29.09 (98.51)

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Four 480/80R46;**,14(95)	Four 480/80R46;**,10(70)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	4115 lb (1866 kg)	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Four 380/85R34;**,17(160)	Two 380/85R34;**,23(160)
<b>Ballast</b> - Duals (total)	1300 lb (590 kg)	None
- Cast Iron (total)	1130 lb (513 kg)	None
<b>Height of Drawbar</b>	21.0 in (535 mm)	21.0 in (535 mm)
<b>Static Weight with operator</b> - Rear	17700 lb (8029 kg)	14055 lb (6375 kg)
- Front	12800 lb (5806 kg)	9900 lb (4491 kg)
- Total	30500 lb(13835 kg)	23955 lb(10866 kg)

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

CATEGORY: III

Quick Attach: Yes

Maximum Force Exerted Through Whole Range: lift cylinders 2x100 mm lift cylinders 1x100 mm & 1x115 mm

i) Opening pressure of relief valve: NA NA

Sustained pressure at compensator cutoff: 2950 psi (204 bar) 2975 psi (205 bar)  
**High flow option**  
**two outlet sets combined**

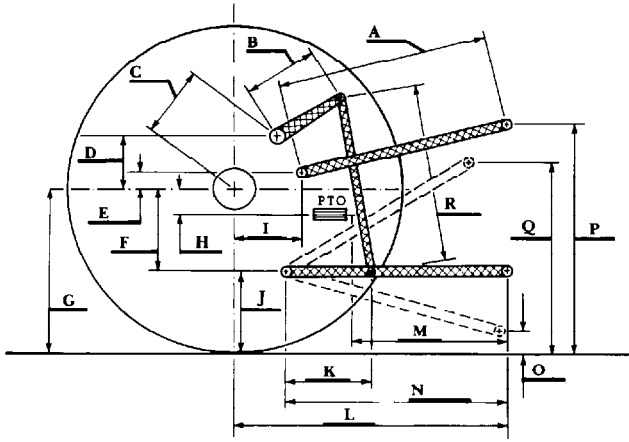
ii) Pump delivery rate at minimum pressure and rated engine speed: 35.2 GPM (133.2 l/min) 43.2 GPM (163.5 l/min)

iii) Pump delivery rate at maximum hydraulic power: 33.2 GPM (125.7 l/min) 42.2 GPM (159.7 l/min)  
 Delivery pressure: 2700 psi (186 bar) 2455 psi (169 bar)  
 Power: 52.4 HP (39.1 kW) 60.4 HP (45.1 kW)

**single outlet set**

ii) Pump delivery rate at minimum pressure and rated engine speed: 34.3 GPM (129.8 l/min) 35.4 GPM (134.0 l/min)

iii) Pump delivery rate at maximum hydraulic power: 32.9 GPM (124.5 l/min) 30.7 GPM (116.2 l/min)  
 Delivery pressure: 2090 psi (144 bar) 2100 psi (144 bar)  
 Power: 40.1 HP (29.9 kW) 37.6 HP (28.0 kW)



### HITCH DIMENSIONS AS TESTED NO LOAD

	inch	mm
A	28.8	732
B	20.5	520
C	21.7	550
D	19.5	495
E	7.3	185
F	13.8	350
G	37.6	955
H	7.8	197
I	20.3	515
J	23.8	605
K	28.9	733
L	49.9	1268
*L'	53.4	1357
M	22.0	558
N	38.1	1082
O	9.0	230
P	42.6	1164
Q	39.2	995
R	45.3	1150

\*L' to Quick Attach ends



**JOHN DEERE 8420 DIESEL**

Agricultural Research Division  
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