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Test 1747: John Deere 8400T Diesel 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1747—SUMMARY 263

JOHN DEERE 8400T DIESEL

16 SPEED

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

Dates of Test: April 8 - May 1, 1998

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/kWh)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1007 rpm)					
226.73 (169.08)	2200	13.00 (49.21)	0.404 (0.246)	17.44 (3.44)	
Maximum Power (2 hours)					
255.16 (190.27)	2000	13.60 (51.47)	0.376 (0.229)	18.77 (3.70)	
VARYING POWER AND FUEL CONSUMPTION					
226.73 (169.08)	2000	13.00 (49.21)	0.404 (0.246)	17.44 (3.44)	Air temperature
197.76 (147.47)	2258	11.87 (44.92)	0.423 (0.257)	16.66 (3.28)	75°F (24°C)
148.86 (111.00)	2269	9.40 (35.58)	0.445 (0.271)	15.84 (3.12)	Relative humidity
99.89 (74.48)	2280	6.98 (26.41)	0.493 (0.300)	14.32 (2.82)	43%
49.68 (37.05)	2290	4.81 (18.19)	0.682 (0.415)	10.34 (2.04)	Barometer
1.00 (0.75)	2299	2.81 (10.63)	19.752 (12.015)	0.36 (0.07)	28.65" Hg (97.02 kPa)

Maximum Torque 795 lb.-ft. (1078 Nm) at 1199 rpm
 Maximum Torque Rise 47.1%
 Torque rise at 1800 engine rpm 35%

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/kWh)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—9th Gear									
195.75 (145.97)	15925 (70.84)	4.61 (7.42)	2208	3.28	0.468 (0.284)	15.09 (2.97)	188 (87)	73 (23)	28.75 (97.36)
75% of Pull at Maximum Power—9th Gear									
152.36 (113.62)	11926 (53.05)	4.79 (7.71)	2261	1.83	0.491 (0.299)	14.35 (2.83)	188 (86)	76 (24)	28.69 (97.16)
50% of Pull at Maximum Power—9th Gear									
103.06 (76.85)	7955 (35.39)	4.86 (7.82)	2272	0.97	0.563 (0.342)	12.54 (2.47)	184 (84)	76 (24)	28.68 (97.12)
75% of Pull at Reduced Engine Speed—11th Gear									
152.36 (113.61)	11933 (53.08)	4.79 (7.71)	1768	1.83	0.430 (0.261)	16.41 (3.23)	189 (87)	76 (24)	28.68 (97.12)
50% of Pull at Reduced Engine Speed—11th Gear									
103.05 (76.85)	7942 (35.33)	4.87 (7.83)	1782	0.89	0.471 (0.287)	14.97 (2.95)	187 (86)	76 (24)	28.68 (97.12)

FUEL OIL and TIME: Fuel No. 2 Diesel Cetane No. 50.6 Specific gravity converted to 60°/60° F (15°/15°C) 0.8471 Fuel weight 7.053 lbs/gal (0.845 kg/l) Oil SAE 15W-40 API service classification CD, CE, 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 intercooler Serial No. *RG6081H040198* Crankshaft lengthwise Rated engine speed 2200 Bore and stroke (as specified) 4.56" × 5.06" (115.8 mm × 128.5 mm) Compression ratio 16.5 to 1 Displacement 496 cu in (8132 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements and aspirator Oil filter one full flow cartridge and aspirator 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 vertical Cooling medium temperature control two thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 85.3-92.8 lb/h (38.7-42.1 kg/h) High idle: 2275-2325 rpm Turbo boost nominal 19.7-23.9 psi (136-165 kPa) as measured 22.8 psi (157 kPa)

CHASSIS: Type Tracklayer-rubber tracked Serial No. *RW8400T902165* Tread width 60.0" (1524 mm) to 88.0" (2235 mm) Length of track on ground 89.0" (2260 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio with full range operator controlled powershift 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 multiple wet disc hydraulically actuated by foot pedal Brakes wet multiple disc hydraulically actuated by foot pedal Steering electro-hydraulic differential steering controlled by steering wheel Power take-off 1000 rpm at 2180 engine rpm Unladen tractor mass 25000 lb (11340 kg)

**DRAWBAR PERFORMANCE (Unballasted)
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/kWh)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
110.25 (82.21)	25021 (111.30)	1.65 (2.66)	2254	14.54	0.577 (0.351)	12.23 (2.41)	182 (83)	62 (17)	28.78 (97.46)
4th Gear									
131.27 (97.89)	22780 (101.33)	2.16 (3.48)	2173	9.19	0.517 (0.315)	13.64 (2.69)	185 (85)	64 (18)	28.77 (97.43)
5th Gear									
154.88 (115.49)	22238 (98.92)	2.61 (4.20)	2156	8.72	0.491 (0.299)	14.35 (2.83)	184 (84)	71 (22)	28.77 (97.43)
6th Gear									
172.89 (128.92)	22167 (98.60)	2.92 (4.71)	2143	8.86	0.485 (0.295)	14.54 (2.86)	187 (86)	72 (22)	28.76 (97.39)
7th Gear									
195.78 (145.99)	22114 (98.37)	3.32 (5.34)	2155	9.06	0.479 (0.291)	14.72 (2.90)	183 (84)	72 (22)	28.76 (97.39)
8th Gear									
206.36 (153.89)	22068 (98.16)	3.51 (5.64)	2023	9.45	0.466 (0.283)	15.15 (2.98)	188 (86)	75 (24)	28.72 (97.26)
9th Gear									
215.06 (160.37)	19922 (88.62)	4.05 (6.52)	1999	6.26	0.446 (0.271)	15.80 (3.11)	189 (87)	74 (23)	28.74 (97.32)
10th Gear									
216.31 (161.30)	17389 (77.35)	4.67 (7.51)	1997	4.17	0.444 (0.270)	15.88 (3.13)	191 (88)	75 (24)	28.73 (97.29)
11th Gear									
215.97 (161.05)	15151 (67.39)	5.35 (8.60)	1999	2.97	0.443 (0.269)	15.92 (3.14)	195 (90)	75 (24)	28.73 (97.26)
12th Gear									
215.78 (160.91)	13282 (59.08)	6.09 (9.81)	2004	2.29	0.446 (0.271)	15.82 (3.12)	194 (90)	75 (24)	28.71 (97.22)
13th Gear									
214.03 (159.60)	10282 (45.73)	7.81 (12.56)	1999	1.44	0.447 (0.272)	15.79 (3.11)	192 (89)	75 (24)	28.70 (97.19)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

NOTE: The 8400T engine has an electronic control system which provides a vehicle protection system to avoid overloading the drive train. This system provides four different engine power levels. The engine produces 160 PTO Hp when the transmission is in gears 1 through 4 and the PTO is not engaged. The engine produces 180 PTO Hp when the transmission is in 5th gear and the PTO is not engaged. The engine produces 200 PTO Hp when the transmission is in 6th gear and the PTO is not engaged. The engine produces 225 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 return was maintained at 170°F (76°C). The performance results on this summary were taken from OECD tests conducted under the Code II Test Code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1747**, Summary 263, May 26, 1998.

LEONARD L. BASHFORD
Director

M. F. KOCHER
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB

	dB(A)
At 75% load in 9th Gear	76.8
Bystander in 16th gear	88.8

TRACKS, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Track Width	24.0 in (610 mm)	24.0 in (610 mm)
Ballast—Cast iron—Front (total)	2165 lb (982 kg)	None
Height of Drawbar	18.5 in (470 mm)	18.0 in (455 mm)
Static Weight with operator	27330 lb (12397 kg)	25165 lb (11415 kg)

**DRAWBAR PERFORMANCE (Ballasted at 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/kWh)	Temp.°F (°C) cool- ing med	Barom. inch Hg (kPa)		
3rd Gear									
122.57 (91.40)	27993 (124.52)	1.64 (2.64)	2212	13.60	0.546 (0.332)	12.92 (2.54)	183 (84)	57 (14)	28.70 (97.19)
4th Gear									
138.77 (103.48)	25003 (111.22)	2.08 (3.35)	2074	8.56	0.494 (0.301)	14.27 (2.81)	186 (85)	62 (17)	28.70 (97.19)
5th Gear									
163.86 (122.19)	24955 (111.01)	2.46 (3.96)	2037	9.06	0.470 (0.286)	14.99 (2.95)	183 (84)	67 (19)	28.70 (97.19)
6th Gear									
181.26 (135.16)	24287 (108.03)	2.80 (4.50)	2046	8.92	0.467 (0.284)	15.10 (2.97)	187 (86)	70 (21)	28.70 (97.19)
7th Gear									
205.38 (153.15)	23920 (106.40)	3.22 (5.18)	2087	9.19	0.469 (0.285)	15.03 (2.96)	185 (85)	72 (22)	28.70 (97.19)
8th Gear									
219.68 (163.82)	22703 (100.99)	3.63 (5.84)	2005	5.60	0.435 (0.265)	16.21 (3.19)	188 (86)	61 (16)	28.76 (97.39)
9th Gear									
224.21 (167.20)	20190 (89.81)	4.16 (6.70)	2002	3.85	0.426 (0.259)	16.57 (3.26)	186 (86)	59 (15)	28.80 (97.53)
10th Gear									
224.72 (167.57)	17774 (79.06)	4.74 (7.63)	2001	2.95	0.426 (0.259)	16.57 (3.26)	188 (87)	59 (15)	28.80 (97.53)
11th Gear									
223.31 (166.52)	15444 (68.70)	5.42 (8.73)	2006	2.26	0.428 (0.260)	16.47 (3.24)	190 (88)	62 (17)	28.79 (97.49)
12th Gear									
221.96 (165.52)	13558 (60.31)	6.14 (9.88)	2003	1.72	0.429 (0.261)	16.43 (3.24)	193 (89)	62 (17)	28.79 (97.49)
13th Gear									
219.69 (163.82)	10511 (46.76)	7.84 (12.61)	1998	1.10	0.433 (0.264)	16.28 (3.21)	193 (89)	61 (16)	28.77 (97.43)

**DRAWBAR PERFORMANCE (Ballasted at 2200 RPM)
MAXIMUM POWER IN SELECTED GEARS**

3rd Gear									
118.91 (86.67)	27163 (120.82)	1.64 (2.64)	2226	14.26	0.560 (0.341)	12.60 (2.48)	183 (84)	57 (14)	28.70 (97.19)
4th Gear									
134.47 (100.28)	22048 (98.07)	2.29 (3.68)	2198	5.31	0.501 (0.305)	14.07 (2.77)	185 (85)	58 (14)	28.70 (97.19)
5th Gear									
157.31 (117.30)	21186 (94.24)	2.78 (4.48)	2201	4.88	0.476 (0.289)	14.83 (2.92)	186 (85)	66 (19)	28.70 (97.19)
6th Gear									
174.50 (130.13)	20841 (92.70)	3.14 (5.05)	2202	5.03	0.471 (0.287)	14.97 (2.95)	184 (84)	68 (20)	28.70 (97.19)
7th Gear									
196.04 (146.19)	20738 (92.24)	3.55 (5.71)	2202	5.31	0.467 (0.284)	15.11 (2.98)	185 (85)	72 (22)	28.70 (97.19)
8th Gear									
201.48 (150.25)	18504 (82.31)	4.08 (6.57)	2201	3.18	0.453 (0.275)	15.58 (3.07)	187 (86)	62 (17)	28.76 (97.39)
9th Gear									
201.43 (150.20)	16238 (72.23)	4.65 (7.49)	2202	2.34	0.454 (0.276)	15.55 (3.06)	188 (86)	58 (14)	28.80 (97.53)
10th Gear									
200.31 (149.37)	14229 (63.29)	5.28 (8.50)	2205	1.96	0.456 (0.278)	15.45 (3.04)	188 (86)	60 (16)	28.80 (97.53)
11th Gear									
199.83 (149.01)	12535 (55.76)	5.98 (9.62)	2196	1.57	0.455 (0.277)	15.50 (3.05)	188 (86)	61 (16)	28.80 (97.53)
12th Gear									
197.91 (147.58)	10969 (48.79)	6.77 (10.89)	2197	1.18	0.462 (0.281)	15.26 (3.01)	188 (87)	62 (17)	28.78 (97.46)
13th Gear									
193.43 (144.24)	8375 (32.75)	8.66 (13.94)	2203	0.94	0.470 (0.286)	14.99 (2.95)	187 (86)	61 (16)	28.77 (97.43)

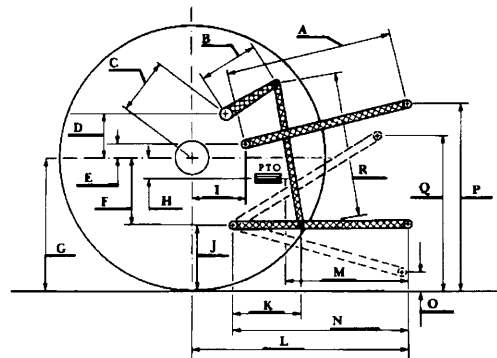
THREE POINT HITCH PERFORMANCE (OECD Static Test)

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 of the open relief valve: 2890 psi (199 bar)
- ii) Pump delivery rate at minimum pressure: 31.0 GPM (117.3 l/min)
- iii) Pump delivery rate at maximum
hydraulic power: 29.7 GPM (112.4 l/min)
Delivery pressure: 2500 psi (172 bar)
Power: 43.3 HP (32.3 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

THREE POINT HITCH PERFORMANCE (SAE Static Test)

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

As per current SAE test procedures

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)

As per current ASAE test procedures

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)	(75.5)

	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 end of Quick Attach



JOHN DEERE 8400T DIESEL

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