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January 1998

## Nebraska Summary 290: John Deere 6410 Powrquad Diesel 16-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# SUMMARY OF OECD TEST 1806—NEBRASKA SUMMARY 290

## JOHN DEERE 6410 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
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed (PTO speed-1042 rpm)</b>					
90.4 (67.4)	2300	5.45 (20.62)	0.421 (0.256)	16.60 (3.27)	
<b>Standard Power Take-off Speed (1000rpm)</b>					
92.5 (69.0)	2208	5.48 (20.73)	0.413 (0.251)	16.90 (3.33)	
<b>Maximum Power (2 hours)</b>					
98.0 (73.1)	1900	5.42 (20.52)	0.386 (0.235)	18.07 (3.56)	

#### VARYING POWER AND FUEL CONSUMPTION

90.4 (67.4)	2300	5.45 (20.62)	0.421 (0.256)	16.60 (3.27)	Air temperature
80.5 (60.0)	2404	5.17 (19.58)	0.449 (0.273)	15.55 (3.06)	68°F (20°C)
61.2 (45.6)	2435	4.37 (16.56)	0.500 (0.304)	13.96 (2.75)	Relative humidity
40.9 (30.5)	2442	3.57 (13.52)	0.609 (0.371)	11.45 (2.26)	33%
20.9 (15.6)	2460	2.72 (10.30)	0.907 (0.551)	7.69 (1.52)	Barometer
--	2475	1.81 (6.84)	--	--	29.6" Hg (100.3 kPa)

Maximum Torque - 293 lb.-ft. (397 Nm) at 1404 rpm  
 Maximum Torque Rise - 42.3%  
 Torque rise at 1800 engine rpm - 38%

#### 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)
<b>Maximum Power 8th (1C) Gear</b>									
74.8 (55.8)	6135 (27.29)	4.57 (7.36)	2300	8.5	0.513 (0.312)	13.60 (2.68)	194 (90)	79 (26)	29.5 (100.0)
<b>75% of Pull at Maximum Power 8th (1C) Gear</b>									
60.1 (44.8)	4595 (20.43)	4.90 (7.90)	2412	6.4	0.563 (0.342)	12.40 (2.44)	194 (90)	77 (25)	29.5 (100.0)
<b>50% of Pull at Maximum Power 8th (1C) Gear</b>									
41.3 (30.8)	3060 (13.62)	5.06 (8.14)	2435	4.3	0.671 (0.408)	10.41 (2.05)	183 (84)	81 (27)	29.5 (100.0)
<b>75% of Pull at Reduced Engine Speed 10th (2C) Gear</b>									
59.9 (44.7)	4575 (20.36)	4.91 (7.91)	2009	6.7	0.510 (0.310)	13.71 (2.70)	187 (86)	79 (26)	29.5 (100.0)
<b>50% of Pull at Reduced Engine Speed 10th (2C) Gear</b>									
41.4 (30.9)	3060 (13.62)	5.08 (8.17)	2040	4.7	0.578 (0.352)	12.07 (2.38)	183 (84)	81 (27)	29.5 (100.0)

**Location of Test:** DLG Testing Station for Agricultural Machinery Max - Eyth - Weg 1, D-64823 Gros-Umstadt, Germany

**Dates of Test:** May - June, 1998

**Manufacturer:** Deere & Company, Moline, Illinois, USA

**FUEL and OIL:** Fuel No. 2 Diesel Specific gravity converted to 60°/60° F (15°/15°C) 0.838 Fuel weight 6.97 lbs/gal (0.836 kg/l) Oil SAE 0W-40 API service classification CF-4 Transmission and hydraulic lubricant John Deere Hy-Gard J 20 C fluid Front axle lubricant John Deere J 20 C fluid.

**ENGINE:** Make John Deere Diesel Type four cylinder vertical with turbocharger Serial No. 522357 Crankshaft lengthwise Rated engine speed 2300 Bore and stroke 4.19" x 5.00" (106.5 mm x 127.0 mm) Compression ratio 16.9 to 1 Displacement 276 cu in (4525 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements 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 Muffler underhood Exhaust vertical Cooling medium temperature control thermostat and variable speed fan

**CHASSIS:** Type front wheel assist Serial No. 216676 Tread width rear 63.0" (1600 mm) to 78.9" (2004 mm) front 59.7" (1516 mm) to 84.1" (2136 mm) Wheel base 94.5" (2400 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 1.53 (2.46) second 1.84 (2.96) third 2.21 (3.55) fourth 2.70 (4.35) fifth 3.07 (4.94) sixth 3.70 (5.95) seventh 4.42 (7.12) eighth 5.00 (8.05) ninth 5.42 (8.73) tenth 6.02 (9.69) eleventh 7.21 (11.61) twelfth 8.84 (14.23) thirteenth 10.76 (17.31) fourteenth 12.96 (20.85) fifteenth 15.51 (24.97) sixteenth 19.01 (30.59) reverse 1.81 (2.92), 2.18 (3.51), 2.62 (4.21), 3.20 (5.15), 3.64 (5.86), 4.38 (7.05), 5.25 (8.45), 5.93 (9.55), 6.43 (10.35), 7.15 (11.50), 8.56 (13.77), 10.48 (16.87), 12.76 (20.54), 15.37 (24.73), 18.40 (29.61), 22.54 (36.28) Clutch multiple wet disc hydraulically operated by foot pedal Brakes wet disc hydraulically operated by two foot pedals which can be locked together Steering hydrostatic Power take-off 540 rpm at 2143 engine rpm or 1000 rpm at 2208 engine rpm. Unladen tractor mass 9680 lb (4390 kg)

**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	Air dry bulb	Barom. inch Hg (kPa)	
6th(2B) Gear									
74.0 (55.2)	9480 (42.18)	2.93 (4.71)	2150	15.0	0.526 (0.320)	13.26 (2.61)	187 (86)	68 (20)	29.5 (100.0)
7th(3B) Gear									
76.8 (57.3)	9125 (40.59)	3.16 (5.08)	1903	14.1	0.495 (0.302)	14.06 (2.77)	187 (86)	66 (19)	29.5 (100.0)
8th(1C) Gear									
78.2 (58.3)	8080 (35.94)	3.63 (5.84)	1900	12.3	0.449 (0.297)	14.26 (2.81)	198 (92)	75 (24)	29.5 (100.0)
9th(4B) Gear									
77.9 (58.1)	7345 (32.67)	3.98 (6.40)	1898	11.2	0.492 (0.299)	14.19 (2.79)	198 (92)	77 (25)	29.5 (100.0)
10th(2C) Gear									
79.4 (59.2)	6600 (29.36)	4.51 (7.26)	1910	9.4	0.481 (0.292)	14.52 (2.86)	198 (92)	75 (24)	29.5 (100.0)
11th(3C) Gear									
79.7 (59.4)	5430 (24.15)	5.50 (8.85)	1900	7.8	0.478 (0.290)	14.59 (2.87)	196 (91)	79 (26)	29.5 (100.0)
12th(4C) Gear									
79.0 (58.9)	4300 (19.13)	6.89 (11.08)	1900	6.2	0.481 (0.293)	14.50 (2.86)	196 (91)	81 (27)	29.5 (100.0)

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

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet the manufacturers claim of 43.3% torque rise. 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 summary of data from OECD Report No. **1806**, Nebraska Summary 290, August 12, 1999.

Leonard L. Bashford  
 Director

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

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
Sound Level in 8th(1C) Gear	72.5	72.0
Maximum Sound level	74.0	73.0
Bystander	--	--

**TIRES 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 18.4-38; 8; 12 (80)  
 Two 14.9-24; 6; 12 (80)  
 20.9 in (530 mm)  
 6160 lb (2795 kg)  
 3685 lb (1670 kg)  
 9845 lb (4465 kg)

## THREE POINT HITCH PERFORMANCE (OECD Static Test)

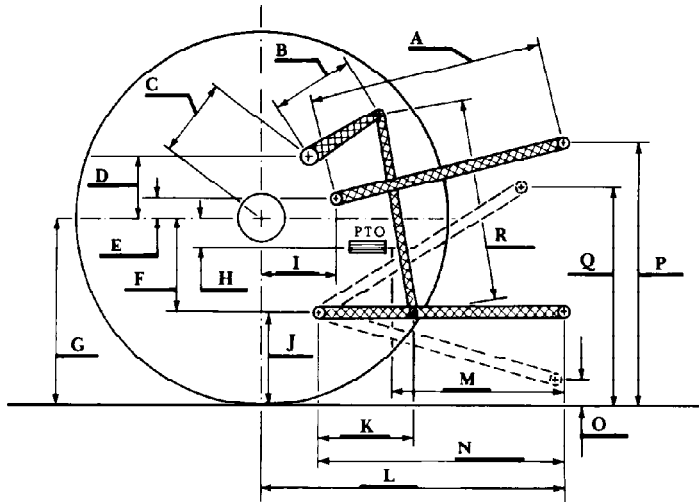
CATEGORY: II

Quick Attach: none

Maximum Force Exerted Through Whole Range: 5765 lbs (25.65 kN) (at the frame)  
 6675 lbs (29.70 kN) (at the hitch points)

- i) Opening pressure of relief valve: NA
- Sustained pressure of the open relief valve: 2945 psi (203 bar)
- ii) Pump delivery rate at minimum pressure: 26.7 GPM (101.0 l/min)
- iii) Pump delivery rate at maximum
  - hydraulic power: 23.8 GPM (90.3 l/min)
  - Delivery pressure: 2250 psi (155 bar)
  - Power: 31.2 HP (23.3 kW)

### HITCH DIMENSIONS AS TESTED NO LOAD



	inch	mm
A	25.6	650
B	12.0	305
C	19.9	505
D	18.7	475
E	7.4	188
F	8.9	225
G	32.3	820
H	2.8	70
I	18.1	460
J	23.4	595
K	19.8	503
L	42.5	1080
M	21.7	550
N	37.2	945
O	7.9	200
P	47.4	1205
Q	33.5	850
R	32.7	830