

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F.
Larsen

2011

Test 1987: John Deere 6430

Nebraska Tractor Test Laboratory

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](#)

Laboratory, Nebraska Tractor Test, "Test 1987: John Deere 6430" (2011). *Nebraska Tractor Tests*. 2385. <https://digitalcommons.unl.edu/tractormuseumlit/2385>

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 1987—SUMMARY 760

JOHN DEERE 6430 DIESEL

16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/lp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed (PTO speed-1041 rpm)					
102.46 (76.40)	2296	6.76 (25.58)	0.465 (0.283)	15.16 (2.99)	
Standard Power Take-off Speed (1000 rpm)					
105.41 (78.60)	2205	6.65 (25.18)	0.445 (0.271)	15.85 (3.12)	
Maximum Power (1 hour)					
111.06 (82.82)	1995	6.65 (25.17)	0.423 (0.257)	16.70 (3.29)	

VARYING POWER AND FUEL CONSUMPTION

102.46 (76.40)	2296	6.76 (25.58)	0.465 (0.283)	15.16 (2.99)	Air temperature
89.77 (66.94)	2369	6.29 (23.82)	0.495 (0.301)	14.27 (2.81)	76°F (24°C)
68.03 (50.73)	2396	5.47 (20.71)	0.567 (0.345)	12.44 (2.45)	Relative humidity
45.91 (34.24)	2417	4.56 (17.26)	0.701 (0.426)	10.07 (1.98)	18%
23.31 (17.38)	2455	3.38 (12.81)	1.024 (0.623)	6.89 (1.36)	Barometer
4.03 (3.01)	2456	2.35 (8.88)	4.107 (2.498)	1.72 (0.34)	28.85" Hg (97.70 kPa)

Maximum Torque - 326 lb.-ft. (442 Nm) at 1597 rpm
 Maximum Torque rise - 39.1%
 Torque rise at 1797 engine rpm - 34%
 Power increase at 1995 rpm - 8.4%

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/lp.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									
88.45 (65.96)	7434 (33.07)	4.47 (7.19)	2300	5.1	0.543 (0.330)	13.00 (2.56)	187 (86)	67 (19)	28.58 (96.78)
75% of Pull at Maximum Power—7th (B3) Gear									
69.70 (51.98)	5579 (24.82)	4.69 (7.54)	2380	3.8	0.609 (0.371)	11.58 (2.28)	187 (86)	65 (18)	28.56 (96.72)
50% of Pull at Maximum Power—7th (B3) Gear									
47.90 (35.72)	3738 (16.63)	4.81 (7.74)	2411	2.6	0.753 (0.458)	9.37 (1.85)	187 (86)	64 (18)	28.56 (96.72)
75% of Pull at Reduced Engine Speed—10th (C2) Gear									
69.65 (51.94)	5585 (24.84)	4.68 (7.53)	1730	3.6	0.539 (0.328)	13.10 (2.58)	182 (83)	64 (18)	28.57 (96.75)
50% of Pull at Reduced Engine Speed—10th (C2) Gear									
47.80 (35.64)	3755 (16.70)	4.78 (7.68)	1744	2.5	0.611 (0.372)	11.55 (2.28)	181 (83)	64 (18)	28.53 (96.61)

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

Dates of tests: April 12 - 25, 2011

Manufacturer: Deere & Company, Moline, Illinois, USA

FUEL, OIL and Time: Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8476 Fuel weight 7.057 lbs/gal (0.846 kg/l) Oil SAE 15W-40 API service classification CJ-4 Transmission and hydraulic lubricant John Deere Hy-Gard II fluid Front axle lubricant John Deere Hy-Gard II fluid Total time engine was operated 22.0 hours.

ENGINE: Make John Deere Diesel Type four cylinder vertical with turbocharger and water to air intercooler Serial No. CD4045L163727 Crankshaft lengthwise Rated engine speed 2300 Bore and stroke 4.19" x 5.00" (106.5 mm x 127.0 mm) Compression ratio 16.7 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, engine coolant heat exchanger for hydraulic and transmission oil Fuel filter one paper element Fuel cooler radiator for pump return fuel Muffler underhood Exhaust vertical Cooling medium temperature control thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 45.6 - 49.6 lb/h (20.7 - 22.5 kg/h) High idle: 2410 - 2510 rpm Turbo boost: nominal 8.7-11.6 psi (60-80 kPa) as measured 10.0 psi (69 kPa)

CHASSIS: Type front wheel assist Serial No. L06430H657849 Tread width rear 56.9" (1446 mm) to 75.4" (1916 mm) front 59.9" (1522 mm) to 79.3" (2014 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 1.60 (2.57) second 1.92 (3.09) third 2.30 (3.70) fourth 2.81 (4.53) fifth 3.20 (5.15) sixth 3.85 (6.20) seventh 4.61 (7.42) eighth 5.26 (8.46) ninth 5.65 (9.09) tenth 6.33 (10.19) eleventh 7.58 (12.20) twelfth 9.29 (14.95) thirteenth 10.83 (17.43) fourteenth 13.04 (20.98) fifteenth 15.62 (25.13) sixteenth 19.13 (30.78) reverse 1.67 (2.68), 2.01 (3.23), 2.40 (3.86), 2.94 (4.73), 3.34 (5.37), 4.02 (6.47), 4.82 (7.75), 5.49 (8.84), 5.90 (9.49), 6.61 (10.64), 7.92 (12.74), 9.69 (15.60), 11.31 (18.20), 13.61 (21.90), 16.30 (26.23), 19.96 (32.12)

DRAWBAR PERFORMANCE
Unballasted-Front Drive Engaged-2300 Engine RPM
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/kW.h)	Temp. °F(°C) cooling med	Temp. °F(°C) Air dry bulb	Barom. inch Hg (kPa)	
5th (B1) Gear									
79.09 (58.97)	10113 (44.98)	2.94 (4.72)	2364	12.4	0.603 (0.367)	11.70 (2.30)	185 (85)	42 (6)	28.59 (96.82)
6th (B2) Gear									
87.91 (65.55)	9024 (40.14)	3.66 (5.88)	2300	6.9	0.546 (0.332)	12.93 (2.55)	185 (85)	42 (6)	28.60 (96.85)
7th (B3) Gear									
88.45 (65.96)	7434 (33.07)	4.47 (7.19)	2300	5.2	0.543 (0.330)	13.00 (2.56)	187 (86)	67 (19)	28.58 (96.78)
8th (C1) Gear									
87.15 (64.99)	6359 (28.29)	5.14 (8.27)	2300	4.2	0.551 (0.335)	12.81 (2.52)	187 (86)	65 (19)	28.62 (96.92)
9th (B4) Gear									
85.50 (63.76)	5789 (25.75)	5.54 (8.92)	2299	3.8	0.562 (0.342)	12.56 (2.47)	187 (86)	67 (20)	28.59 (96.82)
10th (C2) Gear									
86.80 (64.73)	5217 (23.21)	6.24 (10.04)	2301	3.3	0.552 (0.336)	12.78 (2.52)	185 (85)	62 (17)	28.64 (96.99)
11th (C3) Gear									
87.80 (65.47)	4386 (19.51)	7.51 (12.09)	2300	2.9	0.544 (0.331)	12.97 (2.55)	186 (86)	63 (17)	28.64 (96.99)
12th (C4) Gear									
83.30 (62.12)	3372 (15.00)	9.27 (14.91)	2300	2.4	0.588 (0.358)	12.00 (2.36)	186 (85)	65 (18)	28.63 (96.95)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 7th(B3) Gear	71.8	71.7
Transport in 16th(D4) gear	--	74.3
Bystander in 16th(D4) gear	--	84.1

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 460/85R38;**, 12 (80)
 Two 380/85R24;**, 12 (80)
 21.0 in (534 mm)
 6275 lb (2846 kg)
 3710 lb (1683 kg)
 9985 lb (4529 kg)

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 9810 lb (4450 kg)

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 111°F(44°C). The performance figures on this summary were taken from a test conducted under the OECD Code 2 test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1987**, Nebraska Summary 760, May 19, 2011.

Roger M. Hoy
 Director

M.F. Kocher
 D.R. Keshwani
 P.J. Jasa
 Board of Tractor Test Engineers

DRAWBAR PERFORMANCE
Unballasted-Front Drive Engaged-2000 Engine 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(B1) Gear									
79.93 (59.60)	10125 (45.04)	2.96 (4.76)	2364	11.5	0.592 (0.360)	11.91 (2.35)	186 (86)	42 (5)	28.59 (96.82)
6th(B2) Gear									
89.24 (66.55)	9699 (43.14)	3.45 (5.55)	2217	8.7	0.533 (0.324)	13.23 (2.61)	185 (85)	42 (6)	28.61 (96.88)
7th(B3) Gear									
94.40 (70.39)	9244 (41.12)	3.83 (6.16)	2041	8.1	0.508 (0.309)	13.89 (2.74)	187 (86)	65 (19)	28.56 (96.72)
8th(C1) Gear									
95.20 (70.99)	8152 (36.26)	4.38 (7.05)	2001	6.0	0.501 (0.305)	14.10 (2.78)	185 (85)	67 (19)	28.60 (96.85)
9th(B4) Gear									
94.35 (70.36)	7464 (33.20)	4.74 (7.63)	2001	5.2	0.506 (0.308)	13.95 (2.75)	186 (86)	67 (19)	28.58 (96.78)
10th(C2) Gear									
95.70 (71.36)	6685 (29.74)	5.37 (8.64)	2001	4.4	0.496 (0.302)	14.22 (2.80)	184 (84)	63 (17)	28.64 (96.99)
11th(C3) Gear									
97.15 (72.44)	5629 (25.04)	6.47 (10.41)	2001	3.8	0.491 (0.299)	14.38 (2.83)	186 (86)	65 (18)	28.63 (96.95)
12th(C4) Gear									
94.05 (70.13)	4403 (19.59)	8.01 (12.89)	2001	2.9	0.509 (0.310)	13.87 (2.73)	186 (86)	65 (18)	28.63 (96.95)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE DISENGAGED
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)
Maximum Power—8th (C1) Gear									
86.00 (64.13)	6419 (28.55)	5.03 (8.09)	2300	5.5	0.560 (0.341)	12.60 (2.48)	186 (86)	66 (19)	28.61 (96.88)
75% of Pull at Maximum Power—8th (C1) Gear									
67.90 (50.63)	4806 (21.38)	5.30 (8.53)	2380	3.7	0.630 (0.383)	11.20 (2.21)	187 (86)	63 (17)	28.52 (96.58)
50% of Pull at Maximum Power—8th (C1) Gear									
46.45 (34.64)	3214 (14.30)	5.42 (8.72)	2411	2.7	0.780 (0.475)	9.05 (1.78)	187 (86)	59 (15)	28.49 (96.48)
75% of Pull at Reduced Engine Speed—11th (C3) Gear									
67.90 (50.63)	4803 (21.36)	5.30 (8.53)	1653	3.7	0.544 (0.331)	12.97 (2.55)	182 (83)	63 (17)	28.51 (96.55)
50% of Pull at Reduced Engine Speed—11th (C3) Gear									
46.35 (34.56)	3229 (14.36)	5.39 (8.67)	1662	2.8	0.608 (0.370)	11.61 (2.29)	179 (82)	58 (14)	28.48 (96.44)
MAXIMUM POWER IN SELECTED GEARS									
6th(B2) Gear									
77.76 (57.99)	8282 (36.84)	3.52 (5.66)	2364	11.9	0.606 (0.369)	11.64 (2.29)	186 (85)	42 (6)	28.59 (96.82)
7th(B3) Gear									
85.35 (63.65)	7478 (33.26)	4.28 (6.89)	2300	8.2	0.562 (0.342)	12.55 (2.47)	187 (86)	68 (20)	28.57 (96.75)
8th(C1) Gear									
86.00 (64.13)	6419 (28.55)	5.03 (8.09)	2300	5.5	0.560 (0.341)	12.60 (2.48)	186 (86)	66 (19)	28.61 (96.88)
9th(B4) Gear									
85.25 (63.57)	5890 (26.20)	5.43 (8.73)	2300	4.9	0.563 (0.342)	12.54 (2.47)	186 (86)	67 (20)	28.59 (96.82)
10th(C2) Gear									
86.20 (64.28)	5273 (23.45)	6.13 (9.87)	2301	4.3	0.558 (0.339)	12.65 (2.49)	186 (85)	64 (18)	28.64 (96.99)
11th(C3) Gear									
87.45 (65.21)	4424 (19.68)	7.41 (11.93)	2301	3.5	0.551 (0.335)	12.81 (2.52)	186 (86)	64 (18)	28.63 (96.96)
12th(C4) Gear									
83.70 (62.42)	3436 (15.28)	9.14 (14.70)	2301	3.0	0.581 (0.353)	12.15 (2.39)	187 (86)	65 (18)	28.62 (96.92)

HYDRAULIC PERFORMANCE

CATEGORY: II

Quick Attach: none

OECD Static test

Maximum force exerted through whole range: 4450 lbs (19.8 kN)
 pump size 21.1 GPM(79.8 l/min) 29.0 GPM(109.8 l/min)

i) Sustained pressure of the open relief valve: 2946 psi (203 bar) 2996 psi (207 bar)

ii) Pump delivery rate at minimum pressure: 23.7 GPM (89.8 l/min) 32.1 GPM(121.6 l/min)

iii) Pump delivery rate at maximum

hydraulic power: 24.2 GPM(91.7 l/min) 31.2 GPM(118.2 l/min)

Delivery pressure: 2534 psi (175 bar) 2608 psi (180 bar)

Power: 35.8 HP (26.7 kW) 47.5 HP (35.4 kW)

THREE POINT HITCH PERFORMANCE(SAE static test)

Observed maximum pressure psi. (bar) 2990 (206)

Location: lift cylinder

Hydraulic oil temperature: °F(°C) 149(65)

Location: hydraulic valve

Category: II

Quick attach: none

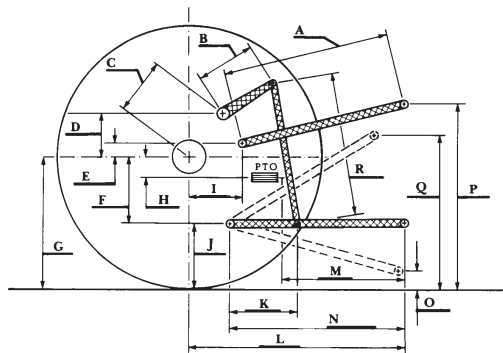
System pressure - 2480 psi (171 Bar)

Hitch point distance to ground level in. (mm) 8.0(203) 15.0(381) 22.0(559) 29.0(737) 36.0(915)

Lift force on frame lb 5622 6020 6106 5970 5356

" " " " " (kN) (25.0) (26.8) (27.2) (26.6) (23.8)

	OECD test		SAE test	
	inch	mm	inch	mm
A	25.8	655	24.4	620
B	12.6	320	12.6	320
C	20.0	507	20.0	507
D	23.9	475	23.9	475
E	9.7	245	9.7	245
F	8.7	220	8.7	220
G	32.3	820	32.3	820
H	4.9	125	4.9	125
I	17.6	448	17.6	448
J	23.6	600	23.6	600
K	19.8	502	19.8	502
L	42.3	1076	42.3	1076
M	21.5	546	21.5	546
N	37.2	945	37.2	945
O	7.9	200	7.9	200
P	47.6	1210	42.6	1083
Q	34.6	880	34.6	880
R	31.3	795	31.3	795



JOHN DEERE 6430 DIESEL