

Tractor Test and Power Museum, The Lester F. Larsen

UNL Larsen Tractor Museum Archives

University of Nebraska - Lincoln

Year 2006

Test 1873: John Deere 8430 16 Speed

NEBRASKA OECD TRACTOR TEST 1873—SUMMARY 527

JOHN DEERE 8430 DIESEL

16 SPEED

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

Dates of tests: March 14 - April 5, 2006

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

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
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1048 rpm)					
253.05 (188.70)	2100	13.57 (51.36)	0.375 (0.228)	18.65 (3.67)	
Standard Power Take-off Speed(999 rpm)					
273.44 (203.90)	2003	14.36 (54.36)	0.367 (0.223)	19.04 (3.75)	
Maximum Power (1 hour)					
289.26 (215.70)	1800	14.92 (56.47)	0.360 (0.219)	19.39 (3.82)	

VARYING POWER AND FUEL CONSUMPTION

253.05 (188.70)	2100	13.57 (51.36)	0.375 (0.228)	18.65 (3.67)	Air temperature
220.64 (164.53)	2154	12.32 (46.63)	0.390 (0.237)	17.91 (3.27)	74°F(23°C)
165.53 (123.44)	2165	9.74 (37.64)	0.420 (0.255)	16.65 (3.28)	Relative humidity
111.09 (82.84)	2174	7.55 (28.59)	0.475 (0.289)	14.71 (2.90)	14%
55.46 (41.36)	2182	6.01 (22.74)	0.757 (0.461)	9.23 (1.82)	Barometer
1.56 (1.17)	2194	3.72 (14.08)	16.628 (10.114)	0.42 (0.08)	29.06" Hg(98.41 kPa)

Maximum Torque - 930 lb.-ft. (1261 Nm) at 1500 rpm
 Maximum Torque Rise - 46.8%
 Torque rise at 1703 engine rpm - 40%

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)
Maximum Power—10th Gear									
223.57 (166.71)	13359 (59.42)	6.28 (10.10)	2099	2.12	0.419 (0.255)	16.70 (3.29)	196 (91)	54 (12)	28.76 (97.39)
75% of Pull at Maximum Power—10th Gear									
173.69 (129.52)	10040 (44.66)	6.49 (10.44)	2155	1.50	0.462 (0.281)	15.13 (2.98)	196 (91)	65 (18)	28.60 (96.85)
50% of Pull at Maximum Power—10th Gear									
116.97 (87.22)	6686 (29.74)	6.56 (10.56)	2167	0.97	0.527 (0.321)	13.26 (2.61)	185 (85)	65 (18)	28.60 (96.85)
75% of Pull at Reduced Engine Speed—12th Gear									
173.34 (129.26)	10012 (44.54)	6.49 (10.45)	1610	1.47	0.428 (0.260)	16.34 (3.22)	199 (93)	65 (18)	28.59 (96.82)
50% of Pull at Reduced Engine Speed—12th Gear									
117.13 (87.34)	6663 (29.64)	6.59 (10.61)	1626	0.99	0.473 (0.287)	14.79 (2.91)	197 (91)	65 (18)	28.59 (96.82)

FUEL, OIL and TIME: Fuel No. 2 Diesel
Specific gravity converted to 60°/60°F (15°/15°C) 0.8395
Fuel weight 6.990 lbs/gal (0.838 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: 26.5 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler
Serial No. *RG6090L001350*
Crankshaft lengthwise
Rated engine speed 2100
Bore and stroke 4.661" x 5.354" (118.4 mm x 136.0 mm)
Compression ratio 16.3 to 1
Displacement 548 cu in (8984 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: 92.2 - 101.9 lb/h (41.8 - 46.2 kg/h)
High idle: 2175 - 2225 rpm
Turbo boost: nominal 26.8 - 31.2 psi (185 - 215 kPa) as measured 30.0 psi (207 kPa)

CHASSIS: Type front wheel assist with duals
Serial No. *RW8430P001459*
Tread width rear 60.0" (1524 mm) to 128.9" (3270 mm) front 64.0" (1625 mm) to 87.6" (2225 mm)
Wheelbase 118.9" (3020 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 1.12 (1.81) second 1.51 (2.43) third 2.01 (3.24) fourth 2.69 (4.33) fifth 3.02 (4.86) sixth 3.48 (5.60) seventh 4.05 (6.51) eighth 4.66 (7.50) ninth 5.39 (8.67) tenth 6.21 (9.99) eleventh 7.21 (11.61) twelfth 8.31 (13.38) thirteenth 9.80 (15.77) fourteenth 13.12 (21.12) fifteenth 17.47 (28.12) sixteenth 23.41 (37.67) reverse 1.06 (1.70), 2.83 (4.55), 3.57 (5.74), 6.55 (10.54) @ 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 1000 rpm at 2003 engine rpm
Unladen tractor mass 24825 lb (11260 kg)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED - 2100 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									
176.16 (131.36)	24028 (106.88)	2.75 (4.42)	2151	14.01	0.496 (0.302)	14.09 (2.77)	179 (82)	43 (6)	29.18 (98.82)
6th Gear									
199.06 (148.44)	23368 (103.95)	3.19 (5.14)	2109	11.66	0.474 (0.288)	14.75 (2.91)	182 (83)	44 (7)	29.17 (98.78)
7th Gear									
216.09 (161.14)	20432 (90.88)	3.97 (6.38)	2099	5.07	0.440 (0.268)	15.88 (3.13)	202 (94)	64 (18)	28.64 (96.99)
8th Gear									
221.04 (164.83)	17881 (79.54)	4.64 (7.46)	2097	3.69	0.431 (0.262)	16.22 (3.19)	200 (93)	64 (18)	28.63 (96.95)
9th Gear									
221.77 (165.37)	15397 (68.49)	5.40 (8.69)	2097	2.80	0.431 (0.262)	16.21 (3.19)	202 (94)	64 (18)	28.62 (96.92)
10th Gear									
223.57 (166.71)	13359 (59.42)	6.28 (10.10)	2099	2.12	0.419 (0.255)	16.70 (3.29)	196 (91)	54 (12)	28.76 (97.39)
11th Gear									
221.48 (165.16)	11340 (50.44)	7.32 (11.79)	2099	1.74	0.425 (0.258)	16.46 (3.24)	201 (94)	58 (14)	28.73 (97.29)
12th Gear									
221.91 (165.48)	9818 (43.67)	8.48 (13.64)	2101	1.49	0.428 (0.260)	16.34 (3.22)	204 (96)	61 (16)	28.70 (97.19)

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 114°F(46°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. **1873**, Nebraska Summary 527, August 7, 2006.

Leonard L. Bashford
 Director

M.F. Kocher
 V.I. Adamchuk
 J.A. Smith
 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	71.3	71.3
Transport speed-no load-16th gear		76.0
Bystander in 16th Gear		88.0

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires - No., size, ply & psi(kPa)	Six 480/80R46;***,9(60)	Four 480/80R46;***,9(60)
Ballast - Triples (total)	2120 lb (962 kg)	None
- Cast Iron (total)	4275 lb (1939 kg)	None
Front Tires - No., size, ply & psi(kPa)	Four 420/90R30;**,13(90)	Two 420/90R30;**,20(140)
Ballast - Duals (total)	1300 lb (589 kg)	None
- Cast Iron (total)	985 lb (447 kg)	None
Height of Drawbar	18.0 in (455 mm)	18.0 in (455 mm)
Static Weight with operator - Rear	20475 lb (9287 kg)	14570 lb (6609 kg)
- Front	13205 lb (5990 kg)	10430 lb (4731 kg)
- Total	33680 lb(15277 kg)	25000 lb(11340 kg)

DRAWBAR PERFORMANCE
UNBALLASTED-FRONT DRIVE ENGAGED - 1800 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)	
5th Gear									
178.36 (133.00)	24047 (106.97)	2.78 (4.48)	2152	13.06	0.492 (0.300)	14.19 (2.80)	180 (82)	43 (6)	29.18 (98.82)
6th Gear									
200.50 (149.52)	23531 (104.67)	3.20 (5.14)	2108	11.55	0.470 (0.286)	14.88 (2.93)	183 (84)	44 (7)	29.17 (98.78)
7th Gear									
223.15 (166.40)	22585 (100.46)	3.71 (5.96)	2020	7.87	0.452 (0.275)	15.47 (3.05)	205 (96)	64 (18)	28.63 (96.95)
8th Gear									
238.22 (177.64)	22305 (99.22)	4.01 (6.45)	1879	7.14	0.439 (0.267)	15.94 (3.14)	204 (95)	63 (17)	28.65 (97.00)
9th Gear									
246.41 (183.74)	20427 (90.86)	4.52 (7.28)	1799	5.14	0.428 (0.260)	16.34 (3.22)	203 (95)	63 (17)	28.64 (96.99)
10th Gear									
256.23 (191.07)	18102 (80.52)	5.31 (8.54)	1799	3.42	0.414 (0.252)	16.90 (3.33)	206 (97)	56 (13)	28.75 (97.36)
11th Gear									
257.70 (192.17)	15540 (69.13)	6.22 (10.01)	1800	2.66	0.404 (0.246)	17.30 (3.41)	202 (94)	60 (16)	28.71 (97.22)
12th Gear									
256.89 (191.56)	13353 (59.40)	7.21 (11.61)	1801	2.18	0.408 (0.248)	17.12 (3.37)	203 (95)	62 (17)	28.68 (97.12)
13th Gear									
257.54 (192.05)	11340 (50.44)	8.52 (13.71)	1796	1.67	0.405 (0.247)	17.24 (3.40)	201 (94)	63 (17)	28.66 (97.05)

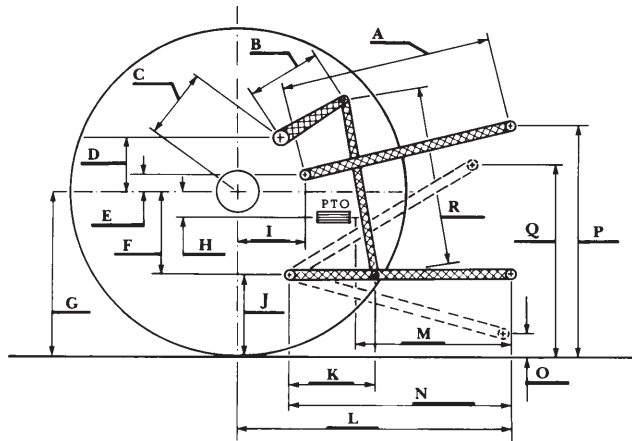
DRAWBAR PERFORMANCE
BALLASTED - FRONT DRIVE ENGAGED - 1800 RPM
MAXIMUM POWER IN SELECTED GEARS

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)
3rd Gear									
172.15 (128.37)	34591 (153.87)	1.87 (3.00)	2153	12.22	0.499 (0.304)	14.00 (2.76)	181 (83)	43 (6)	29.08 (98.48)
4th Gear									
220.99 (164.79)	33064 (147.08)	2.51 (4.03)	2056	7.80	0.443 (0.270)	15.77 (3.11)	187 (86)	44 (7)	29.09 (98.51)
5th Gear									
237.23 (176.90)	32501 (144.57)	2.74 (4.41)	1988	7.18	0.422 (0.257)	16.55 (3.26)	197 (92)	44 (7)	29.09 (98.51)
6th Gear									
250.38 (186.71)	30425 (135.34)	3.09 (4.97)	1909	5.49	0.410 (0.249)	17.07 (3.36)	197 (92)	45 (7)	29.10 (98.54)
7th Gear									
258.80 (192.99)	28399 (126.32)	3.42 (5.50)	1800	4.50	0.403 (0.245)	17.34 (3.42)	204 (95)	46 (8)	29.10 (98.54)
8th Gear									
261.52 (195.01)	24566 (109.28)	3.99 (6.42)	1801	3.70	0.398 (0.242)	17.55 (3.46)	206 (97)	46 (8)	29.11 (98.58)
9th Gear									
260.94 (194.58)	21071 (93.73)	4.64 (7.47)	1801	2.96	0.401 (0.244)	17.45 (3.44)	203 (95)	47 (8)	29.11 (98.58)
10th Gear									
260.62 (194.35)	18154 (80.75)	5.38 (8.66)	1802	2.65	0.403 (0.245)	17.36 (3.42)	205 (96)	47 (8)	29.12 (98.61)
11th Gear									
258.25 (192.58)	15434 (68.65)	6.27 (10.10)	1802	2.02	0.404 (0.246)	17.31 (3.41)	202 (94)	48 (9)	29.12 (98.61)
12th Gear									
257.31 (191.87)	13319 (59.25)	7.24 (11.66)	1799	1.48	0.407 (0.247)	17.18 (3.38)	202 (95)	49 (9)	29.13 (98.64)
13th Gear									
253.32 (188.90)	11098 (49.37)	8.56 (13.78)	1799	1.14	0.413 (0.251)	16.93 (3.33)	202 (94)	50 (10)	29.14 (98.68)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY:	III	IVN
Quick Attach: Yes		
Lift cylinders:	1x112 mm&1x100 mm	2x112 mm
Maximum force exerted through whole range:	17719 lbs (78.8 kN)	18326 lbs (81.5 kN)
	<u>63 cc pump</u>	<u>85 cc pump</u>
i) Sustained pressure at compensator cutoff:	2980 psi (205 bar)	2990 psi (206 bar)
	two outlet sets combined three outlet sets combined	
ii) Pump delivery rate at minimum pressure and rated engine speed:	46.6 GPM(176.3 l/min)	61.6 GPM(233.0 l/min)
iii) Pump delivery rate at maximum hydraulic power:	47.0 GPM(177.8 l/min)	61.5 GPM(232.8 l/min)
Delivery pressure:	2479 psi (171 bar)	2443 psi (168 bar)
Power:	67.9 HP (50.7 kW)	87.7 HP (65.4 kW)
	single outlet set	
ii) Pump delivery rate at minimum pressure and rated engine speed:	42.1 GPM(159.3 l/min)	38.9 GPM(147.3 l/min)
iii) Pump delivery rate at maximum hydraulic power:	38.9 GPM(147.2 l/min)	36.9 GPM(139.7 l/min)
Delivery pressure:	2155 psi (149 bar)	2088 psi (144 bar)
Power:	48.9 HP (36.5 kW)	45.0 HP (33.5 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD



	Category III		Category IVN	
	inch	mm	inch	mm
A	29.3	744	27.1	689
B	20.5	520	20.5	520
C	20.9	532	20.9	532
D	18.9	480	18.9	480
E	7.3	185	12.0	304
F	14.4	365	14.4	365
G	35.6	905	37.0	940
H	7.9	200	7.9	200
I	20.7	525	21.9	555
J	21.2	540	22.6	575
K	21.2	540	23.2	590
L	53.4	1357	56.6	1438
*L'	57.6	1462	62.5	1588
M	26.5	674	29.7	755
N	42.6	1081	45.7	1162
O	9.0	230	9.0	230
P	45.2	1149	49.7	1262
Q	39.4	1001	40.7	1035
R	42.8	1087	43.5	1106

*L' to quick attach ends



JOHN DEERE 8430 PS DIESEL

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