University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-2006

Test 1873: John Deere 8430 16 Speed

Follow this and additional works at: http://digitalcommons.unl.edu/tractormuseumlit

Part of the Applied Mechanics Commons

"Test 1873: John Deere 8430 16 Speed" (2006). *Nebraska Tractor Tests.* Paper 188.
http://digitalcommons.unl.edu/tractormuseumlit/188

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 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

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)*

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)*	Fuel Consumption 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)*

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)*	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)*

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*)

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

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

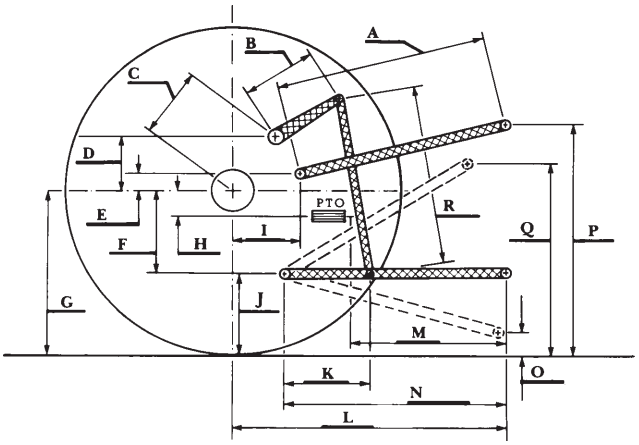
Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					5th Gear				
178.36 *(133.00)*	24047 *(106.97)*	2.78 *(4.48)*	2152	13.06	0.492 *(0.300)*	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)*	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)*
	63 cc pump	85 cc pump
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

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln