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January 2006

## Test 1890: John Deere 8530 IVT

Tractor Museum

University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

John Deere

Deere & Company, JohnDeere@deere.com

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# NEBRASKA OECD TRACTOR TEST 1890—SUMMARY 557

## JOHN DEERE 8530 DIESEL INFINITELY VARIABLE TRANSMISSION

### 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—1050 rpm)</b>					
277.53 (206.95)	2100	15.38 (58.22)	0.388 (0.236)	18.05 (3.55)	
<b>Standard Power Take-off Speed(1000 rpm)</b>					
302.39 (225.49)	2000	16.23 (61.42)	0.376 (0.229)	18.64 (3.67)	
<b>Maximum Power (1 hour)</b>					
312.73 (233.20)	1800	16.65 (63.05)	0.373 (0.227)	18.78 (3.70)	

### VARYING POWER AND FUEL CONSUMPTION

277.53 (206.95)	2100	15.38 (58.22)	0.388 (0.236)	18.05 (3.55)	Air temperature
241.64 (180.19)	2154	14.14 (53.52)	0.410 (0.249)	17.09 (3.37)	76°F(24°C)
182.41 (136.02)	2163	11.81 (44.71)	0.453 (0.276)	15.44 (3.04)	Relative humidity
122.10 (91.05)	2173	9.03 (34.17)	0.518 (0.315)	13.53 (2.66)	41%
61.44 (45.82)	2186	5.94 (22.49)	0.677 (0.412)	10.34 (2.04)	Barometer
1.46 (1.09)	2194	4.16 (15.73)	19.903 (12.107)	0.35 (0.07)	29.06" Hg(98.41 kPa)

Maximum Torque - 1006 lb.-ft. (1364 Nm) at 1597 rpm  
 Maximum Torque Rise - 45.0%  
 Torque rise at 1701 engine rpm - 37%

### 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—6.2 mph (10.0 km/h)</b>									
240.35 (179.23)	15071 (67.04)	5.98 (9.62)	2097	3.02	0.441 (0.269)	15.86 (3.12)	199 (93)	46 (8)	28.82 (97.60)
<b>75% of Pull at Maximum Power—6.2 mph (10.0 km/h)</b>									
187.09 (139.51)	11319 (50.35)	6.20 (9.98)	2157	2.27	0.487 (0.296)	14.39 (2.83)	200 (93)	59 (15)	28.40 (96.17)
<b>50% of Pull at Maximum Power—6.2 mph (10.0 km/h)</b>									
125.61 (93.67)	7502 (33.37)	10.11	2168	1.50	0.565 (0.344)	12.39 (2.44)	195 (91)	58 (14)	28.40 (96.17)
<b>75% of Pull at Reduced Engine Speed—Auto mode</b>									
186.73 (139.24)	11279 (50.17)	6.21 (9.99)	1734	2.24	0.455 (0.277)	15.40 (3.03)	204 (96)	58 (14)	28.40 (96.17)
<b>50% of Pull at Reduced Engine Speed—Auto mode</b>									
126.20 (94.11)	7515 (33.43)	10.14	1350	1.47	0.435 (0.265)	16.10 (3.17)	189 (87)	58 (14)	28.40 (96.17)

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

**Dates of tests:** October 5 - 25, 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)** 0.8409  
**Fuel weight** 7.002 lbs/gal (0.839 kg/l)  
**Oil SAE 15W-40 API service classification** CI-4  
**Transmission and hydraulic lubricant** John Deere Hy-Gard fluid  
**Front axle lubricant** John Deere Hy-Gard fluid  
**Total time engine was operated:** 32.0 hours

**ENGINE: Make** John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler  
**Serial No.** \*RG6090L006210\*  
**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 return fuel  
**Muffler** vertical  
**Cooling medium temperature control** 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 104.9 - 113.8 lb/h (47.6 - 51.6 kg/h)  
**High idle:** 2175 - 2225 rpm  
**Turbo boost:** nominal 29.0 - 33.4 psi (200 - 230 kPa) as measured 31.7 psi (218 kPa)

**CHASSIS: Type** front wheel assist with duals  
**Serial No.** \*RW8530D005577\*  
**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** Infinitely variable with four mechanical ranges and automatic shifting between ranges.  
**Nominal travel speeds mph (km/h)** forward - 0-25.0 mph, (0-40 km/h) reverse - 0-12.5 mph (0-20 km/h)  
**Clutch** a foot pedal controls the hydrostatic oil flow  
**Brakes** wet multiple disc hydraulically operated by two foot pedals that can be locked together  
**Steering** hydrostatic  
**Power take-off** 1000 rpm at 2000 engine rpm  
**Unladen tractor mass** 26800 lb (12156 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED - 2100 RPM**  
**MAXIMUM POWER AT SELECTED SPEED SETTINGS**

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)
212.46 (158.43)	24641 (109.61)	3.23 (5.20)	2128	11.01	0.500 (0.304)	14.00 (2.76)	202 (95)	61 (16)	28.53 (96.61)
221.43 (165.12)	23003 (102.32)	3.61 (5.81)	2098	8.84	0.483 (0.294)	14.49 (2.86)	201 (94)	61 (16)	28.53 (96.61)
227.30 (169.50)	21066 (93.71)	4.05 (6.51)	2098	6.37	0.470 (0.286)	14.90 (2.93)	200 (94)	61 (16)	28.53 (96.61)
233.71 (174.28)	19624 (87.29)	4.47 (7.19)	2099	4.78	0.450 (0.274)	15.55 (3.06)	203 (95)	59 (15)	28.40 (96.17)
237.86 (177.37)	18859 (83.89)	4.73 (7.61)	2100	4.21	0.442 (0.269)	15.84 (3.12)	201 (94)	59 (15)	28.40 (96.17)
239.51 (178.60)	16798 (74.72)	5.35 (8.60)	2097	3.64	0.439 (0.267)	15.95 (3.14)	201 (94)	59 (15)	28.40 (96.17)
240.35 (179.23)	15071 (67.04)	5.98 (9.62)	2097	3.02	0.441 (0.269)	15.86 (3.12)	199 (93)	46 (8)	28.82 (97.60)
240.25 (179.15)	13657 (60.75)	6.60 (10.62)	2098	2.73	0.440 (0.268)	15.92 (3.14)	200 (94)	49 (9)	28.82 (97.60)
238.21 (177.63)	12355 (54.96)	7.23 (11.64)	2101	2.40	0.444 (0.270)	15.76 (3.10)	199 (93)	51 (11)	28.81 (97.56)
236.42 (176.30)	11321 (50.36)	7.83 (12.60)	2097	2.19	0.448 (0.273)	15.63 (3.08)	198 (92)	52 (11)	28.80 (97.53)
235.85 (175.87)	10448 (46.47)	8.47 (13.62)	2101	2.05	0.449 (0.273)	15.58 (3.07)	201 (94)	53 (12)	28.80 (97.53)

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

**NOTE:** Manual mode was selected by placing the AutoPowr(IVT) selector in the OFF position. Auto mode was selected by placing the Autopowr (IVT) selector in position 3.

**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 119°F(49°C). This tractor had a power bulge of 12.7% which did not meet the manufacturer's claim of 13% power bulge. 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. **1890**, Nebraska Summary 557, December 8, 2006.

Roger M. Hoy  
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 at 4.6 mph (7.5 km/h)	71.4	71.2
Transport speed - no load		74.5
Bystander		86.5

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi (kPa)	Six 480/80R50;***;11(80)	Four 480/80R50;***;11(80)
<b>Ballast</b> - Triples (total)	2420 lb (1098 kg)	None
- Cast Iron (total)	4760 lb (2159 kg)	None
<b>Front Tires</b> - No., size, ply & psi (kPa)	Four 420/85R34;***;17(120)	Two 420/85R34;***;23(160)
<b>Ballast</b> - Duals (total)	1620 lb (735 kg)	None
- Cast Iron (total)	1385 lb (628 kg)	None
<b>Height of Drawbar</b>	19.5 in (495 mm)	19.0 in (485 mm)
<b>Static Weight with operator</b> - Rear	22430 lb (10174 kg)	15765 lb (7151 kg)
- Front	14710 lb (6673 kg)	11190 lb (5076 kg)
- Total	37140 lb (16847 kg)	26955 lb (12227 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED - 1800 RPM**  
**MAXIMUM POWER AT SELECTED SPEED SETTINGS**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption		Temp. °F(°C)	Air dry bulb	Barom. inch Hg (kPa)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med		
3.6 mph (5.8 km/h)									
214.27 (159.78)	24839 (110.49)	3.23 (5.21)	2122	10.70	0.496 (0.302)	14.12 (2.78)	198 (92)	61 (16)	28.53 (96.61)
4.0 mph (6.4 km/h)									
218.94 (163.26)	23315 (103.71)	3.52 (5.67)	2081	10.24	0.494 (0.301)	14.17 (2.79)	201 (94)	61 (16)	28.53 (96.61)
4.3 mph (7.0 km/h)									
233.68 (174.26)	22748 (101.19)	3.85 (6.20)	2043	8.44	0.471 (0.287)	14.86 (2.93)	200 (93)	61 (16)	28.54 (96.65)
4.7 mph (7.5 km/h)									
248.56 (185.35)	22443 (99.83)	4.15 (6.68)	2008	7.39	0.450 (0.274)	15.55 (3.06)	201 (94)	61 (16)	28.54 (96.65)
5.0 mph (8.0 km/h)									
253.52 (189.05)	22152 (98.54)	4.29 (6.91)	1965	7.10	0.448 (0.273)	15.63 (3.08)	200 (94)	61 (16)	28.54 (96.65)
5.6 mph (9.0 km/h)									
262.49 (195.74)	21686 (96.46)	4.54 (7.31)	1839	6.70	0.442 (0.269)	15.84 (3.12)	200 (93)	61 (16)	28.54 (96.65)
6.2 mph (10.0 km/h)									
271.03 (202.11)	20111 (89.46)	5.05 (8.13)	1802	4.63	0.430 (0.262)	16.27 (3.21)	200 (93)	47 (8)	28.82 (97.60)
6.8 mph (11.0 km/h)									
274.60 (204.77)	18401 (81.85)	5.60 (9.01)	1803	4.02	0.424 (0.258)	16.50 (3.25)	199 (93)	50 (10)	28.82 (97.60)
7.5 mph (12.0 km/h)									
272.81 (203.43)	16688 (74.23)	6.13 (9.87)	1801	3.49	0.425 (0.258)	16.48 (3.25)	199 (93)	51 (11)	28.81 (97.56)
8.1 mph (13.0 km/h)									
272.09 (202.90)	15276 (67.95)	6.68 (10.75)	1805	3.18	0.425 (0.259)	16.46 (3.24)	199 (93)	52 (11)	28.80 (97.53)
8.7 mph (14.0 km/h)									
272.40 (203.13)	14185 (63.10)	7.20 (11.59)	1802	2.91	0.427 (0.260)	16.38 (3.23)	199 (93)	54 (12)	28.80 (97.53)
9.3 mph (15.0 km/h)									
271.13 (202.18)	13134 (58.42)	7.74 (12.46)	1804	2.62	0.430 (0.262)	16.28 (3.21)	199 (93)	55 (13)	28.79 (97.49)
9.9 mph (16.0 km/h)									
270.27 (201.54)	12250 (54.49)	8.27 (13.32)	1804	2.47	0.431 (0.262)	16.26 (3.20)	199 (93)	55 (13)	28.79 (97.49)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED - AUTO MODE**  
**MAXIMUM POWER AT SELECTED SPEED SETTINGS**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption		Temp. °F (°C)		Barom. inch Hg (kPa)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med	Air dry bulb	
3.6 mph (5.8 km/h)									
210.25 (156.78)	24315 (108.16)	3.24 (5.22)	1905	11.54	0.489 (0.297)	14.33 (2.82)	204 (95)	61 (16)	28.53 (96.61)
4.0 mph (6.4 km/h)									
220.64 (164.53)	22895 (101.84)	3.61 (5.82)	1992	8.54	0.472 (0.287)	14.82 (2.92)	203 (95)	61 (16)	28.53 (96.61)
4.3 mph (7.0 km/h)									
228.44 (170.35)	20990 (93.37)	4.08 (6.57)	2007	6.18	0.457 (0.278)	15.33 (3.02)	204 (95)	61 (16)	28.54 (96.65)
4.7 mph (7.5 km/h)									
233.80 (174.35)	19593 (87.15)	4.47 (7.20)	2034	4.83	0.444 (0.270)	15.78 (3.11)	202 (95)	59 (15)	28.40 (96.17)
5.0 mph (8.0 km/h)									
237.63 (177.20)	18900 (84.07)	4.71 (7.59)	2046	4.34	0.439 (0.267)	15.94 (3.14)	201 (94)	59 (15)	28.40 (96.17)
5.6 mph (9.0 km/h)									
240.29 (179.18)	16854 (74.97)	5.35 (8.60)	2040	3.67	0.434 (0.264)	16.14 (3.18)	201 (94)	59 (15)	28.40 (96.17)
6.2 mph (10.0 km/h)									
240.54 (179.37)	15034 (66.87)	6.00 (9.66)	2019	3.09	0.434 (0.264)	16.14 (3.18)	200 (93)	48 (9)	28.82 (97.60)
6.8 mph (11.0 km/h)									
240.19 (179.11)	13585 (60.43)	6.63 (10.67)	2009	2.72	0.434 (0.264)	16.12 (3.17)	199 (93)	51 (11)	28.81 (97.56)
7.5 mph (12.0 km/h)									
238.08 (177.53)	12276 (54.61)	7.27 (11.70)	2018	2.39	0.439 (0.267)	15.95 (3.14)	199 (93)	52 (11)	28.81 (97.56)
8.1 mph (13.0 km/h)									
236.71 (176.52)	11232 (49.96)	7.90 (12.72)	2007	2.19	0.441 (0.268)	15.87 (3.13)	199 (93)	53 (12)	28.80 (97.53)
8.7 mph (14.0 km/h)									
236.26 (176.18)	10403 (46.27)	8.52 (13.71)	2043	2.04	0.446 (0.271)	15.71 (3.09)	199 (93)	54 (12)	28.79 (97.49)

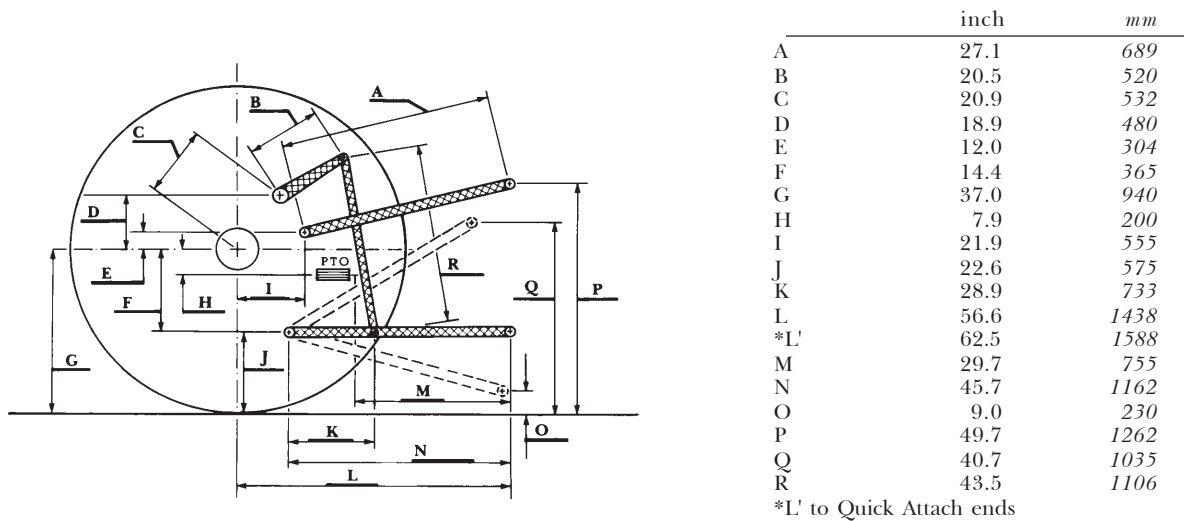
**DRAWBAR PERFORMANCE**  
**BALLASTED- FRONT DRIVE ENGAGED - 1800 RPM**  
**MAXIMUM POWER AT SELECTED SPEED SETTINGS**

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)
199.70 (148.92)	36832 (163.84)	2.03 (3.27)	2128	13.27	0.526 (0.320)	13.32 (2.62)	192 (89)	44 (7)	28.81 (97.56)
226.22 (168.69)	34835 (154.95)	2.44 (3.92)	2058	9.30	0.478 (0.290)	14.66 (2.89)	199 (93)	46 (8)	28.81 (97.56)
246.73 (183.99)	33834 (150.50)	2.73 (4.40)	1977	8.13	0.455 (0.277)	15.38 (3.03)	202 (94)	50 (10)	28.80 (97.53)
258.79 (192.98)	32720 (145.55)	2.97 (4.77)	1843	7.17	0.446 (0.271)	15.69 (3.09)	204 (96)	50 (10)	28.79 (97.49)
267.00 (199.10)	29028 (129.12)	3.45 (5.55)	1801	5.34	0.436 (0.265)	16.08 (3.17)	200 (93)	51 (11)	28.78 (97.46)
270.49 (201.70)	26879 (119.57)	3.77 (6.07)	1802	4.65	0.430 (0.262)	16.27 (3.20)	199 (93)	52 (11)	28.77 (97.43)
272.48 (203.19)	25651 (114.10)	3.98 (6.41)	1801	4.27	0.425 (0.258)	16.48 (3.25)	202 (95)	53 (12)	28.76 (97.39)
274.40 (204.62)	22773 (101.30)	4.52 (7.27)	1802	3.55	0.425 (0.259)	16.46 (3.24)	200 (93)	54 (12)	28.75 (97.36)
275.84 (205.69)	20519 (91.27)	5.04 (8.11)	1801	3.09	0.421 (0.256)	16.64 (3.28)	199 (93)	54 (12)	28.75 (97.36)
276.30 (206.04)	18617 (82.81)	5.57 (8.96)	1802	2.79	0.420 (0.256)	16.65 (3.28)	205 (96)	55 (13)	28.74 (97.33)
274.46 (204.67)	16932 (75.32)	6.08 (9.78)	1799	2.49	0.423 (0.257)	16.56 (3.26)	199 (93)	55 (13)	28.73 (97.29)
273.13 (203.68)	15538 (69.12)	6.59 (10.61)	1797	2.28	0.425 (0.258)	16.48 (3.25)	200 (94)	56 (13)	28.72 (97.26)
272.30 (203.06)	14321 (63.70)	7.13 (11.48)	1800	2.05	0.425 (0.259)	16.46 (3.24)	200 (93)	56 (13)	28.72 (97.26)
271.06 (202.13)	13274 (59.05)	7.66 (12.32)	1801	1.84	0.430 (0.262)	16.27 (3.20)	199 (93)	57 (14)	28.71 (97.22)
269.81 (201.20)	12390 (55.12)	8.17 (13.14)	1799	1.74	0.430 (0.262)	16.27 (3.21)	199 (93)	58 (14)	28.70 (97.19)

### THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY:	IVN
Quick Attach: Yes	
Lift cylinders:	2x112 mm
Maximum force exerted through whole range:	18326 lbs (81.5 kN)
<b>85 cc pump</b>	
i) Sustained pressure at compensator cutoff:	2990 psi (206 bar)
	<b>three outlet sets combined</b>
ii) Pump delivery rate at minimum pressure and rated engine speed:	61.5 GPM (232.8 l/min)
iii) Pump delivery rate at maximum hydraulic power:	61.4 GPM (232.4 l/min)
Delivery pressure:	2469 psi (170 bar)
Power:	88.4 HP (66.0 kW)
	<b>single outlet set</b>
ii) Pump delivery rate at minimum pressure and rated engine speed:	39.0 GPM (147.6 l/min)
iii) Pump delivery rate at maximum hydraulic power:	37.3 GPM (141.2 l/min)
Delivery pressure:	2077 psi (143 bar)
Power:	45.2 HP (33.7 kW)

### HITCH DIMENSIONS AS TESTED—NO LOAD



**JOHN DEERE 8530 IVT DIESEL**

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln