

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

---

2010

## Test 1972: John Deere 8345R

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 1972: John Deere 8345R" (2010). *Nebraska Tractor Tests*. 2386. <https://digitalcommons.unl.edu/tractormuseumlit/2386>

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 1972-SUMMARY 733

## JOHN DEERE 8345R 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—1051 rpm)</b>					
285.49 (212.89)	2102	15.57 (58.93)	0.383 (0.233)	18.34 (3.61)	
<b>Standard Power Take-off Speed(1000 rpm)</b>					
313.52 (233.79)	2000	16.90 (63.97)	0.378 (0.230)	18.55 (3.65)	
<b>Maximum Power (1 hour)</b>					
325.01 (242.36)	1802	17.31 (65.54)	0.374 (0.228)	18.77 (3.70)	

#### VARYING POWER AND FUEL CONSUMPTION

285.49 (212.89)	2102	15.57 (58.93)	0.383 (0.233)	18.34 (3.61)	Air temperature
248.54 (185.33)	2153	14.17 (53.65)	0.400 (0.244)	17.54 (3.45)	73°F (23°C)
187.22 (139.61)	2163	11.50 (43.52)	0.431 (0.262)	16.28 (3.21)	Relative humidity
125.44 (93.54)	2174	8.68 (32.86)	0.486 (0.296)	14.45 (2.85)	33%
63.00 (46.98)	2184	6.35 (24.02)	0.707 (0.431)	9.93 (1.96)	Barometer
1.98 (1.48)	2195	4.17 (15.77)	14.765 (8.981)	0.48 (0.09)	28.78" Hg (97.46 kPa)

Maximum Torque - 1053 lb.-ft. (1428 Nm) at 1496 rpm  
 Maximum Torque Rise - 47.7%  
 Torque rise at 1698 engine rpm - 39%  
 Power increase at 1802 rpm - 13.8%

#### 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 dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—5.6 mph (9.0 km/h)</b>								
249.74 (186.23)	17899 (79.62)	5.24 (8.42)	2098	4.3	0.435 (0.265)	16.14 (3.18)	204 (96)	58 (14)
<b>75% of Pull at Maximum Power—5.6 mph (9.0 km/h)</b>								
193.53 (144.31)	13370 (59.47)	5.43 (8.74)	2157	3.2	0.473 (0.288)	14.84 (2.92)	202 (95)	69 (21)
<b>50% of Pull at Maximum Power—5.6 mph (9.0 km/h)</b>								
130.82 (97.55)	8892 (39.55)	5.52 (8.88)	2169	2.3	0.527 (0.321)	13.32 (2.62)	186 (85)	69 (21)
<b>75% of Pull at Reduced Engine Speed—Automode</b>								
193.36 (144.19)	13412 (59.66)	5.41 (8.70)	1727	3.3	0.451 (0.275)	15.56 (3.07)	203 (95)	69 (21)
<b>50% of Pull at Reduced Engine Speed—Automode</b>								
131.10 (97.76)	8994 (40.01)	5.47 (8.80)	1372	2.4	0.447 (0.272)	15.72 (3.10)	201 (94)	70 (21)

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

**Dates of tests:** May 11 - June 4, 2010

**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) 0.8433 Fuel weight 7.022 lbs/gal (0.842 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: 40.5 hours

**ENGINE: Make** John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No. \***RG6090L069070\* **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:** 108.2 - 117.1 lb/h (49.1 - 53.1 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 28.3 - 32.6 psi (195 - 225 kPa) as measured 29.5 psi (203 kPa)

**CHASSIS: Type** front wheel assist with duals **Serial No. \***1RW8345RA9D003572\* **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 - 26.1 mph, (0 - 42 km/h) reverse - 0 - 12.4 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** 27060 lb (12274 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)
223.11 (166.37)	27038 (120.27)	3.10 (4.98)	2124	11.0	0.477 (0.290)	14.73 (2.90)	196 (91)	52 (11)	28.92 (97.93)
239.66 (178.71)	24947 (110.97)	3.61 (5.80)	2102	7.9	0.454 (0.276)	15.48 (3.05)	203 (95)	58 (14)	28.92 (97.93)
245.76 (183.26)	23219 (103.28)	3.97 (6.39)	2097	6.7	0.441 (0.268)	15.92 (3.14)	204 (95)	61 (16)	28.92 (97.93)
246.54 (183.84)	21274 (94.63)	4.35 (6.99)	2097	5.9	0.440 (0.268)	15.95 (3.14)	202 (94)	61 (16)	28.95 (98.04)
248.03 (184.95)	19654 (87.43)	4.73 (7.61)	2101	5.0	0.436 (0.265)	16.11 (3.17)	202 (94)	62 (17)	28.95 (98.04)
249.74 (186.23)	17899 (79.62)	5.24 (8.42)	2098	4.3	0.435 (0.265)	16.14 (3.18)	204 (96)	58 (14)	28.94 (98.00)
250.18 (186.56)	16073 (71.50)	5.84 (9.40)	2098	4.1	0.433 (0.263)	16.22 (3.19)	202 (94)	59 (15)	28.94 (98.00)
247.57 (184.61)	14410 (64.10)	6.45 (10.37)	2099	3.4	0.437 (0.266)	16.07 (3.17)	202 (95)	60 (16)	28.95 (98.04)
247.40 (184.49)	13116 (58.34)	7.08 (11.39)	2098	2.8	0.440 (0.268)	15.96 (3.14)	202 (94)	57 (14)	28.93 (97.97)
244.16 (182.07)	11962 (53.21)	7.66 (12.32)	2099	2.6	0.445 (0.271)	15.79 (3.11)	203 (95)	63 (17)	28.96 (98.07)
244.40 (182.25)	11078 (49.28)	8.28 (13.32)	2098	2.4	0.441 (0.269)	15.91 (3.13)	202 (94)	63 (17)	28.96 (98.07)

**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 115°F(46 °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. **1972**, Nebraska Summary 733, July 27, 2010.

Roger M. Hoy  
Director

M.F. Kocher  
D.R. Keshwani  
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) engine speed - 2190 rpm	71.4	71.1
At no load at 4.6 mph (7.5 km/h) engine speed - 1400 rpm	66.9	66.6
Transport speed - no load - manual mode		73.6
Transport speed - no load - Automode 3		71.9
Bystander		85.6

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Six 480/80R50;***;12(85)	Four 480/80R50;***;12(85)
<b>Ballast</b> - Triples (total)	2420 lb (1098 kg)	None
- Cast Iron (total)	6325 lb (2869 kg)	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Four 420/85R34;***;16(110)	Two 420/85R34;***;23(160)
<b>Ballast</b> - Duals (total)	1620 lb (735 kg)	None
- Cast Iron (total)	1185 lb (537 kg)	None
<b>Height of Drawbar</b>	20.0 in (510 mm)	20.0 in (510 mm)
<b>Static Weight with operator</b> - Rear	24245 lb (10998 kg)	15980 lb (7249 kg)
- Front	14540 lb (6595 kg)	11255 lb (5105 kg)
- Total	38785 lb (17593 kg)	27235 lb (12354 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)		Barom. inch Hg (kPa)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med	Air dry bulb	
3.5 mph (5.6 km/h)									
224.46 (167.38)	27123 (120.65)	3.10 (4.99)	2122	10.3	0.475 (0.289)	14.78 (2.91)	195 (90)	52 (11)	28.92 (97.93)
4.0 mph (6.4 km/h)									
243.38 (181.49)	26135 (116.25)	3.50 (5.62)	2077	9.9	0.456 (0.277)	15.40 (3.03)	204 (95)	60 (16)	28.92 (97.93)
4.3 mph (7.0 km/h)									
255.78 (190.74)	25504 (113.45)	3.76 (6.05)	2034	9.5	0.445 (0.271)	15.77 (3.11)	204 (95)	62 (17)	28.92 (97.93)
4.7 mph (7.6 km/h)									
264.21 (197.02)	24262 (107.92)	4.08 (6.57)	2009	8.1	0.440 (0.267)	15.97 (3.15)	203 (95)	64 (18)	28.92 (97.93)
5.1 mph (8.2 km/h)									
267.86 (199.74)	23628 (105.10)	4.25 (6.84)	1994	7.9	0.435 (0.264)	16.15 (3.18)	203 (95)	66 (19)	28.92 (97.93)
5.6 mph (9.0 km/h)									
276.60 (206.26)	22788 (101.36)	4.55 (7.32)	1878	7.3	0.433 (0.264)	16.20 (3.19)	202 (95)	68 (20)	28.92 (97.93)
6.2 mph (10.0 km/h)									
281.24 (209.72)	21350 (94.97)	4.94 (7.95)	1807	5.6	0.425 (0.259)	16.51 (3.25)	202 (95)	59 (15)	28.94 (98.00)
6.8 mph (11.0 km/h)									
281.46 (209.88)	19327 (85.97)	5.46 (8.79)	1807	5.0	0.425 (0.259)	16.52 (3.25)	202 (95)	60 (16)	28.95 (98.04)
7.5 mph (12.0 km/h)									
281.66 (210.03)	17565 (78.13)	6.02 (9.68)	1806	4.4	0.424 (0.258)	16.57 (3.26)	202 (94)	57 (14)	28.93 (97.97)
8.1 mph (13.0 km/h)									
280.30 (209.02)	16144 (71.81)	6.51 (10.48)	1802	3.9	0.424 (0.258)	16.55 (3.26)	202 (95)	63 (17)	28.96 (98.07)
8.7 mph (14.0 km/h)									
280.30 (209.02)	14903 (66.29)	7.05 (11.35)	1803	3.5	0.425 (0.258)	16.53 (3.26)	202 (94)	63 (17)	28.96 (98.07)
9.3 mph (15.0 km/h)									
279.62 (208.51)	13895 (61.81)	7.55 (12.14)	1800	3.2	0.427 (0.260)	16.46 (3.24)	202 (94)	64 (18)	28.96 (98.07)
9.9 mph (16.0 km/h)									
278.76 (207.87)	12939 (57.56)	8.08 (13.00)	1799	2.9	0.425 (0.259)	16.50 (3.25)	201 (94)	64 (18)	28.96 (98.07)

**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	
3.5 mph (5.6 km/h)									
223.78 (166.87)	27025 (120.21)	3.11 (5.00)	1940	12.0	0.470 (0.286)	14.95 (2.95)	204 (96)	54 (12)	28.92 (97.93)
4.0 mph (6.4 km/h)									
241.86 (180.36)	26025 (115.77)	3.49 (5.61)	2081	10.2	0.455 (0.277)	15.42 (3.04)	205 (96)	61 (16)	28.92 (97.93)
4.3 mph (7.0 km/h)									
254.09 (189.47)	25359 (112.80)	3.76 (6.04)	2039	9.8	0.448 (0.272)	15.68 (3.09)	205 (96)	63 (17)	28.92 (97.93)
4.7 mph (7.6 km/h)									
263.48 (196.47)	24229 (107.78)	4.08 (6.57)	2011	8.4	0.439 (0.267)	16.00 (3.15)	205 (96)	65 (18)	28.92 (97.93)
5.1 mph (8.2 km/h)									
269.08 (200.65)	23621 (105.07)	4.27 (6.87)	1994	8.1	0.434 (0.264)	16.17 (3.19)	205 (96)	67 (19)	28.92 (97.93)
5.6 mph (9.0 km/h)									
272.75 (203.39)	22458 (99.90)	4.56 (7.33)	1945	6.7	0.433 (0.264)	16.20 (3.19)	203 (95)	69 (21)	28.92 (97.93)
6.2 mph (10.0 km/h)									
275.93 (205.76)	20761 (92.35)	4.99 (8.02)	1945	5.6	0.429 (0.261)	16.37 (3.23)	203 (95)	59 (15)	28.94 (98.00)
6.8 mph (11.0 km/h)									
275.76 (205.63)	18982 (84.44)	5.45 (8.77)	1945	5.2	0.429 (0.261)	16.37 (3.23)	203 (95)	61 (16)	28.95 (98.04)
7.5 mph (12.0 km/h)									
277.88 (207.21)	17360 (77.22)	6.01 (9.66)	1944	4.4	0.425 (0.259)	16.51 (3.25)	202 (95)	58 (14)	28.94 (98.00)
8.1 mph (13.0 km/h)									
274.55 (204.73)	15792 (70.25)	6.52 (10.49)	1944	3.9	0.430 (0.261)	16.35 (3.22)	203 (95)	63 (17)	28.96 (98.07)
8.7 mph (14.0 km/h)									
274.28 (204.53)	14623 (65.05)	7.04 (11.32)	1945	3.6	0.431 (0.262)	16.31 (3.21)	202 (94)	64 (18)	28.96 (98.07)
9.3 mph (15.0 km/h)									
274.09 (204.39)	13635 (60.65)	7.54 (12.13)	1944	3.3	0.431 (0.262)	16.31 (3.21)	202 (95)	64 (18)	28.96 (98.07)
9.9 mph (16.0 km/h)									
272.74 (203.38)	12656 (56.30)	8.09 (13.01)	1947	3.1	0.434 (0.264)	16.19 (3.19)	201 (94)	65 (18)	28.96 (98.07)

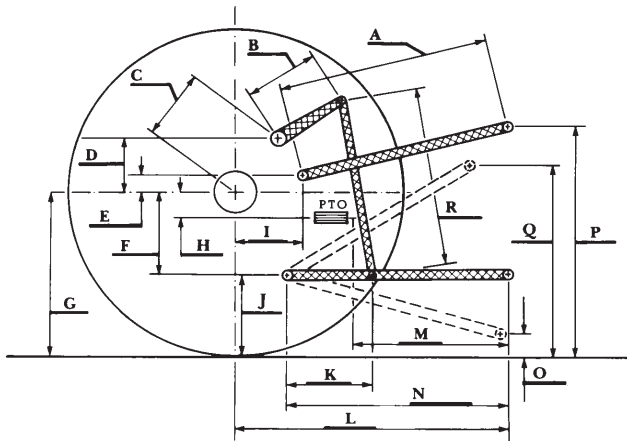
**DRAWBAR PERFORMANCE**  
**BALLASTED- FRONT DRIVE ENGAGED - 1800 RPM**  
**MAXIMUM POWER AT SELECTED SPEED SETTINGS**

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)
211.90 (158.01)	39062 (173.75)	2.03 (3.27)	2113	14.3	0.508 (0.309)	13.82 (2.72)	203 (95)	66 (19)	28.70 (97.19)
248.61 (185.38)	36730 (163.38)	2.54 (4.09)	2010	10.2	0.469 (0.285)	14.98 (2.95)	203 (95)	67 (19)	28.70 (97.19)
263.96 (196.83)	34302 (152.58)	2.89 (4.64)	1924	7.7	0.453 (0.276)	15.49 (3.05)	202 (94)	68 (20)	28.70 (97.19)
271.01 (202.09)	32555 (144.81)	3.13 (5.03)	1804	7.1	0.444 (0.270)	15.83 (3.12)	201 (94)	70 (21)	28.70 (97.19)
274.46 (204.66)	29807 (132.59)	3.45 (5.55)	1802	5.7	0.438 (0.266)	16.05 (3.16)	203 (95)	72 (22)	28.70 (97.19)
276.60 (206.26)	27420 (121.97)	3.78 (6.08)	1802	4.7	0.435 (0.264)	16.15 (3.18)	203 (95)	73 (23)	28.73 (97.29)
279.73 (208.59)	25608 (113.91)	4.10 (6.60)	1802	4.4	0.429 (0.261)	16.37 (3.22)	203 (95)	72 (22)	28.73 (97.29)
281.19 (209.68)	23243 (103.39)	4.54 (7.30)	1807	3.6	0.426 (0.259)	16.46 (3.24)	202 (95)	70 (21)	28.72 (97.26)
281.98 (210.27)	20934 (93.12)	5.06 (8.14)	1804	3.1	0.425 (0.259)	16.51 (3.25)	202 (94)	69 (21)	28.72 (97.26)
281.24 (209.72)	18962 (84.35)	5.56 (8.95)	1801	2.7	0.427 (0.260)	16.45 (3.24)	207 (97)	71 (22)	28.72 (97.26)
278.95 (208.01)	17181 (76.43)	6.09 (9.80)	1805	2.5	0.430 (0.261)	16.35 (3.22)	201 (94)	71 (22)	28.72 (97.26)
276.41 (206.12)	15696 (69.82)	6.61 (10.63)	1801	2.4	0.435 (0.264)	16.15 (3.18)	205 (96)	71 (22)	28.72 (97.26)
274.52 (204.71)	14459 (64.32)	7.12 (11.45)	1801	2.3	0.436 (0.265)	16.09 (3.17)	202 (94)	72 (22)	28.72 (97.26)
274.02 (204.34)	13494 (60.02)	7.62 (12.26)	1798	2.1	0.438 (0.266)	16.05 (3.16)	202 (94)	72 (22)	28.72 (97.26)
273.36 (203.84)	12540 (55.78)	8.18 (13.16)	1804	1.9	0.438 (0.266)	16.03 (3.16)	202 (94)	72 (22)	28.72 (97.26)

## HYDRAULIC PERFORMANCE

CATEGORY:	IVN
Quick Attach: Yes	
OECD Static test	
Lift cylinders:	<u>2x112 mm</u>
Maximum force exerted through whole range:	18326 lbs (81.5 kN)
<hr/>	
	<u>85 cc pump</u>
i) Sustained pressure at compensator cutoff:	2899 psi (200 bar) <b>three outlet sets combined</b>
ii) Pump delivery rate at minimum pressure and rated engine speed:	64.3 GPM (243.3 l/min)
iii) Pump delivery rate at maximum hydraulic power:	64.4 GPM (243.6 l/min)
Delivery pressure:	2431 psi (168 bar)
Power:	91.3 HP (68.1 kW)
<hr/>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	40.3 GPM (152.4 l/min)
iii) Pump delivery rate at maximum hydraulic power:	38.1 GPM (144.3 l/min)
Delivery pressure:	2158 psi (149 bar)
Power:	48.0 HP (35.8 kW)
<hr/>	

### HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	27.1	689
B	20.5	520
C	20.9	532
D	18.9	480
E	12.0	304
F	14.4	365
G	37.0	940
H	7.9	200
I	21.9	555
J	22.6	575
K	28.9	733
L	56.6	1438
*L'	62.5	1588
M	29.7	755
N	45.7	1162
O	9.0	230
P	49.7	1262
Q	40.7	1035
R	43.5	1106

\*L' to Quick Attach ends



**JOHN DEERE 8345R DIESEL**

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln