

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F.  
Larsen

---

January 2007

## Test 1893: John Deere 7630 Autoquad-Plus 20-Speed

Tractor Museum

University of Nebraska-Lincoln, [TractorMuseumArchives@unl.edu](mailto:TractorMuseumArchives@unl.edu)

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



Part of the [Applied Mechanics Commons](#)

---

Museum, Tractor, "Test 1893: John Deere 7630 Autoquad-Plus 20-Speed" (2007). *Nebraska Tractor Tests*. 2070.  
<http://digitalcommons.unl.edu/tractormuseumlit/2070>

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 1893—SUMMARY 560

## JOHN DEERE 7630 AUTOQUAD-PLUS DIESEL

### 20 SPEED

#### 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—1075 rpm)</b>					
141.66 (105.63)	2100	8.31 (31.44)	0.411 (0.250)	17.05 (3.36)	
<b>Standard Power Take-off Speed (1000 rpm)</b>					
157.93 (117.77)	1953	8.88 (33.62)	0.394 (0.240)	17.78 (3.50)	
<b>Maximum Power (1 hour)</b>					
161.88 (120.71)	1750	8.91 (33.75)	0.386 (0.235)	18.16 (3.58)	

#### VARYING POWER AND FUEL CONSUMPTION

141.66 (105.63)	2100	8.31 (31.44)	0.411 (0.250)	17.05 (3.36)	Air temperature
123.49 (92.00)	2156	7.62 (28.83)	0.432 (0.263)	16.21 (3.19)	75°F (24°C)
92.89 (69.26)	2167	6.25 (23.65)	0.472 (0.287)	14.87 (2.93)	Relative humidity
62.47 (46.58)	2176	5.03 (19.06)	0.565 (0.344)	12.41 (2.44)	27%
31.24 (23.30)	2187	4.07 (15.39)	0.912 (0.555)	7.69 (1.51)	Barometer
0.96 (0.72)	2196	2.57 (9.72)	18.674 (11.359)	0.38 (0.07)	28.83" Hg (97.63 kPa)

Maximum torque - 523 lb.-ft. (710 Nm) at 1602 rpm  
 Maximum torque rise - 47.8%  
 Torque rise at 1700 engine rpm - 41%  
 Power increase at 1750 engine rpm - 14.2%

#### 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—8th (C1) Gear</b>									
126.97 (94.68)	9543 (42.45)	4.99 (8.03)	2100	3.01	0.461 (0.281)	15.20 (2.99)	186 (85)	49 (9)	29.03 (98.31)
<b>75% of Pull at Maximum Power—8th (C1) Gear</b>									
99.44 (74.15)	7201 (32.03)	5.18 (8.33)	2159	2.09	0.503 (0.306)	13.93 (2.74)	182 (83)	50 (10)	29.02 (98.27)
<b>50% of Pull at Maximum Power—8th (C1) Gear</b>									
67.10 (50.04)	4795 (21.33)	5.25 (8.45)	2170	1.32	0.603 (0.367)	11.62 (2.29)	175 (79)	50 (10)	29.02 (98.27)
<b>75% of Pull at Reduced Engine Speed—11th (C3) Gear</b>									
99.34 (74.08)	7207 (32.06)	5.17 (8.32)	1494	2.04	0.443 (0.269)	15.84 (3.12)	178 (81)	50 (10)	29.02 (98.27)
<b>50% of Pull at Reduced Engine Speed—11th (C3) Gear</b>									
67.38 (50.24)	4804 (21.37)	5.26 (8.46)	1509	1.32	0.495 (0.301)	14.17 (2.79)	175 (79)	50 (10)	29.02 (98.27)

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

**Dates of tests:** March 22 - April 20, 2007

**Manufacturer:** John Deere Tractor Works, 3500 East Donald Street, 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) 0.8432 Fuel weight 7.011 lbs/gal (0.840 kg/l) Oil SAE 15W-40 API service classification CF-4 Transmission and hydraulic lubricant John Deere Hy-Gard fluid Front axle lubricant John Deere Hy-Gard fluid Total time engine was operated: 30.0 hours

**ENGINE:** Make John Deere Diesel Type six cylinder vertical with turbocharger and air to air intercooler Serial No.\*PE6068L004297\* Crankshaft lengthwise Rated engine speed 2100 Bore and stroke 4.19" x 5.00" (106.5 mm x 127.0 mm) Compression ratio 17.0 to 1 Displacement 414 cu in (6788 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 prestrainer Fuel cooler radiator for pump return fuel Muffler vertical Cooling medium temperature control 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS:** Fuel rate: 53.7 - 59.5 lb/h (24.4 - 27.0 kg/h) High idle: 2175 - 2225 rpm Turbo boost: nominal 14.5-17.4 psi (100-120 kPa) as measured 16.3 psi (112 kPa)

**CHASSIS:** Type front wheel assist Serial No.\*RW7630A002258\* Tread width rear 60.0" (1524 mm) to 109.2" (2774 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) Wheelbase 112.5" (2860 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio with partial (4) range operator controlled power shift Nominal travel speeds mph (km/h) first 1.50 (2.41) second 1.80 (2.90) third 2.16 (3.48) fourth 2.65 (4.26) fifth 3.18 (5.11) sixth 3.83 (6.16) seventh 4.58 (7.37) eighth 5.06 (8.14) ninth 5.61 (9.03) tenth 6.09 (9.80) eleventh 7.29 (11.73) twelfth 8.93 (14.37) thirteenth 9.36 (15.06) fourteenth 11.27 (18.14) fifteenth 13.50 (21.72) sixteenth 13.86 (22.31) seventeenth 16.54 (26.61) eighteenth 16.70 (26.87) nineteenth 20.00 (32.18) twentieth 24.50 (39.42) reverse 1.57 (2.52), 1.88 (3.03), 2.26 (3.63), 2.77 (4.45), 3.31 (5.33), 3.99 (6.42), 4.78 (7.69), 5.28 (8.49), 5.85 (9.42), 6.35 (10.22), 7.61 (12.24), 9.32 (15.00), 9.77 (15.72), 11.76 (18.92), 14.09 (22.67), 14.47 (23.28), 17.26 (27.77), 17.42 (28.04), 20.87 (33.58), 25.56 (41.13)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED-1750 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)	
4th(A4)Gear									
102.62 (76.52)	15874 (70.61)	2.42 (3.90)	2152	12.20	0.545 (0.332)	12.86 (2.53)	179 (82)	41 (5)	29.06 (98.41)
5th(B1)Gear									
120.60 (89.93)	14980 (66.64)	3.02 (4.86)	2130	7.92	0.493 (0.300)	14.22 (2.80)	180 (82)	45 (7)	29.06 (98.41)
6th(B2)Gear									
133.14 (99.28)	14582 (64.87)	3.42 (5.51)	1997	7.50	0.471 (0.287)	14.87 (2.93)	186 (85)	46 (8)	29.06 (98.41)
7th(B3)Gear									
140.23 (104.57)	14089 (62.67)	3.73 (6.01)	1800	6.57	0.451 (0.275)	15.54 (3.06)	189 (87)	46 (8)	29.05 (98.37)
8th(C1)Gear									
143.69 (107.15)	13252 (58.95)	4.07 (6.54)	1750	5.18	0.439 (0.267)	15.95 (3.14)	191 (89)	47 (8)	29.04 (98.34)
9th(B4)Gear									
143.13 (106.73)	11766 (52.34)	4.56 (7.34)	1750	4.15	0.438 (0.266)	16.02 (3.16)	191 (88)	47 (8)	29.05 (98.37)
10th(C2) Gear									
143.45 (106.97)	10804 (48.06)	4.98 (8.01)	1752	3.67	0.438 (0.266)	16.00 (3.15)	194 (90)	48 (9)	29.04 (98.34)
11th(C3)Gear									
145.73 (108.67)	9094 (40.45)	6.01 (9.67)	1750	2.79	0.436 (0.265)	16.09 (3.17)	197 (92)	48 (9)	29.03 (98.31)
12th(C4)Gear									
143.94 (107.34)	7270 (32.34)	7.43 (11.95)	1751	2.02	0.434 (0.264)	16.17 (3.18)	198 (92)	52 (11)	29.01 (98.24)
13th(D1) Gear									
142.82 (106.50)	6889 (30.65)	7.77 (12.51)	1748	1.95	0.434 (0.264)	16.14 (3.18)	200 (93)	51 (11)	29.00 (98.21)
14th(D2) Gear									
143.48 (106.99)	5716 (25.43)	9.41 (15.15)	1750	1.53	0.440 (0.268)	15.93 (3.14)	206 (97)	51 (11)	29.00 (98.21)

**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** 540 rpm at 1950 engine rpm or 1000 rpm at 1950 engine rpm **Unladen tractor mass** 17115 lb (7763 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 134°F (57°C). The pull in 3<sup>rd</sup> (A3) gear (ballasted tractor) was limited to avoid excessive tractor bouncing. 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. **1893**, Nebraska Summary 560, July 2, 2007.

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 in 7th (B3) gear	68.3	68.3
Transport speed - no load - 20th (E4) gear		72.4
Bystander in 20th (E4) gear		83.1

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Four 480/80R42;***;10(70)	Two 480/80R42;***;17(115)
<b>Ballast</b> - Duals (total)	1570 lb (712 kg)	None
- Cast Iron (total)	775 lb (351 kg)	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Two 380/85R30;***;17(115)	Two 380/85R30;***;15(105)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	520 lb (236 kg)	None
<b>Height of Drawbar</b>	18.0 in (455 mm)	18.5 in (470 mm)
<b>Static Weight with operator</b> - Rear	13100 lb (5942 kg)	11010 lb (4994 kg)
- Front	7055 lb (3200 kg)	6280 lb (2849 kg)
- Total	20155 lb (9142 kg)	17290 lb (7843 kg)

**DRAWBAR PERFORMANCE**  
**BALLASTED - FRONT DRIVE ENGAGED - 1750 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)
3rd(A3)Gear									
108.11 (80.62)	19755 (87.87)	2.05 (3.30)	2154	8.79	0.517 (0.315)	13.55 (2.67)	180 (82)	54 (12)	28.78 (97.46)
4th(A4)Gear									
122.10 (91.05)	18396 (81.83)	2.49 (4.01)	2089	6.92	0.491 (0.299)	14.28 (2.81)	185 (85)	55 (13)	28.80 (97.53)
5th(B1)Gear									
136.31 (101.64)	17813 (79.24)	2.87 (4.62)	1998	6.49	0.466 (0.283)	15.05 (2.96)	187 (86)	60 (16)	28.78 (97.46)
6th(B2)Gear									
140.33 (104.65)	16073 (71.49)	3.27 (5.27)	1858	4.74	0.453 (0.276)	15.46 (3.05)	203 (95)	68 (20)	28.86 (97.73)
7th(B3)Gear									
145.01 (108.14)	14517 (64.57)	3.75 (6.03)	1752	3.50	0.439 (0.267)	15.95 (3.14)	202 (94)	67 (19)	28.86 (97.73)
8th(C1)Gear									
145.20 (108.28)	13105 (58.29)	4.15 (6.69)	1751	2.88	0.438 (0.267)	15.99 (3.15)	205 (96)	72 (22)	28.84 (97.66)
9th(B4)Gear									
145.94 (108.83)	11800 (52.49)	4.64 (7.46)	1751	2.40	0.435 (0.265)	16.12 (3.18)	204 (96)	71 (22)	28.85 (97.70)
10th(C2)Gear									
145.66 (108.62)	10853 (48.28)	5.03 (8.10)	1748	2.15	0.436 (0.265)	16.07 (3.17)	205 (96)	74 (23)	28.84 (97.66)
11th(C3)Gear									
145.21 (108.29)	8968 (39.89)	6.07 (9.77)	1751	1.60	0.444 (0.270)	15.79 (3.11)	205 (96)	74 (23)	28.83 (97.63)
12th(C4)Gear									
142.58 (106.32)	7167 (31.88)	7.46 (12.01)	1748	1.18	0.449 (0.273)	15.63 (3.08)	205 (96)	75 (24)	28.83 (97.63)
13th(D1)Gear									
142.04 (105.92)	6788 (30.20)	7.85 (12.63)	1753	1.07	0.453 (0.275)	15.49 (3.05)	205 (96)	75 (24)	28.82 (97.60)
14th(D2)Gear									
141.46 (105.49)	5603 (24.93)	9.47 (15.24)	1751	0.77	0.456 (0.277)	15.38 (3.03)	205 (96)	76 (24)	28.82 (97.60)

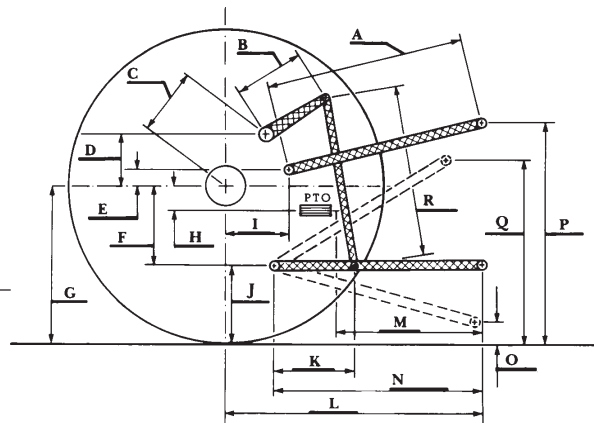
**DRAWBAR PERFORMANCE**  
**BALLASTED - FRONT DRIVE DISENGAGED**  
**FUEL CONSUMPTION CHARACTERISTICS**

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 (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—7th (B3) Gear</b>									
129.02 (96.21)	10702 (47.60)	4.52 (7.28)	2102	2.87	0.461 (0.280)	15.21 (3.00)	195 (91)	65 (18)	28.86 (97.73)
<b>75% of Pull at Maximum Power—7th(B3) Gear</b>									
100.04 (74.60)	8016 (35.66)	4.68 (7.53)	2157	2.04	0.502 (0.305)	13.97 (2.75)	180 (82)	61 (16)	28.78 (97.46)
<b>50% of Pull at Maximum Power—7th (B3) Gear</b>									
67.63 (50.43)	5342 (23.76)	4.75 (7.64)	2172	1.26	0.608 (0.370)	11.53 (2.27)	174 (79)	62 (17)	28.79 (97.49)
<b>75% of Pull at Reduced Engine Speed—10th(C2) Gear</b>									
100.21 (74.73)	8020 (35.67)	4.69 (7.54)	1625	2.01	0.462 (0.281)	15.17 (2.99)	179 (82)	65 (18)	28.80 (97.53)
<b>50% of Pull at Reduced Engine Speed—10th(C2) Gear</b>									
67.67 (50.46)	5332 (23.72)	4.76 (7.66)	1638	1.27	0.529 (0.322)	13.26 (2.61)	177 (81)	63 (17)	28.79 (97.49)
<b>MAXIMUM POWER IN SELECTED GEARS</b>									
4th(A4) Gear									
101.67 (75.82)	15734 (69.99)	2.42 (3.90)	2153	12.09	0.540 (0.328)	12.98 (2.56)	181 (83)	53 (12)	28.80 (97.53)
5th(B1) Gear									
119.90 (89.41)	14817 (65.91)	3.03 (4.88)	2144	7.81	0.500 (0.304)	14.02 (2.76)	183 (84)	58 (14)	28.79 (97.49)
6th(B2) Gear									
126.29 (94.17)	12677 (56.39)	3.74 (6.01)	2102	3.89	0.475 (0.289)	14.76 (2.91)	197 (92)	65 (18)	28.86 (97.73)
7th(B3) Gear									
129.02 (96.21)	10702 (47.60)	4.52 (7.28)	2102	2.87	0.461 (0.280)	15.21 (3.00)	195 (91)	65 (18)	28.86 (97.73)
8th(C1) Gear									
127.56 (95.12)	9532 (42.40)	5.02 (8.08)	2105	2.43	0.468 (0.285)	14.98 (2.95)	199 (93)	72 (22)	28.84 (97.66)
9th(B4) Gear									
126.99 (94.69)	8535 (37.96)	5.58 (8.98)	2101	2.09	0.474 (0.288)	14.79 (2.91)	199 (93)	70 (21)	28.85 (97.70)
10th(C2) Gear									
126.52 (94.35)	7824 (34.80)	6.06 (9.76)	2100	1.88	0.471 (0.286)	14.89 (2.93)	199 (93)	73 (23)	28.84 (97.66)
11th(C3) Gear									
125.84 (93.84)	6471 (28.78)	7.29 (11.74)	2099	1.41	0.484 (0.294)	14.49 (2.85)	199 (93)	74 (23)	28.83 (97.63)
12th(C4) Gear									
123.30 (91.94)	5157 (22.94)	8.97 (14.43)	2098	1.04	0.490 (0.298)	14.31 (2.82)	199 (93)	74 (23)	28.83 (97.63)

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

CATEGORY: III  
Quick Attach: Yes

Lift cylinders:	2 x 90 mm	2x100 mm
Maximum force exerted through whole range:	10987 lbs (48.9 kN)	15574 lbs (69.3 kN)
	45 cc pump	63 cc pump
i) Sustained pressure at compensator cutoff:	2962 psi (204 bar)	2895 psi (200 bar)
	<b>three outlet sets combined</b>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	32.2 GPM (121.9 l/min)	45.0 GPM (170.3 l/min)
iii) Pump delivery rate at maximum hydraulic power:	30.0 GPM (113.6 l/min)	43.6 GPM (165.0 l/min)
Delivery pressure:	2774 psi (191 bar)	2591 psi (179 bar)
Power:	48.6 HP (36.2 kW)	65.9 HP (49.1 kW)
	<b>single outlet set</b>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	31.8 GPM (120.4 l/min)	41.4 GPM (156.7 l/min)
iii) Pump delivery rate at maximum hydraulic power:	30.8 GPM (116.6 l/min)	38.4 GPM (145.4 l/min)
Delivery pressure:	2364 psi (163 bar)	1921 psi (132 bar)
Power:	42.5 HP (31.7 kW)	43.0 HP (32.1 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

### THREE POINT HITCH PERFORMANCE

Observed maximum pressure psi. (bar)	2850 (197)				
Location:	lift cylinders				
Hydraulic oil temperature: °F (°C)	144 (62)				
Location:	hydraulic sump				
Category:	III				
Quick attach:	Yes				
<b>SAE Static Test—System pressure 2610 psi (180 Bar)</b>					
with lift cylinders 2 x 90 mm					
Hitch point distance to ground level in. (mm)	8.1 (205)	16.1 (410)	24.2 (614)	32.2 (818)	40.2 (1020)
Lift force on frame lb	13167	13413	13297	12171	10537
" " " " " " (kN)	(58.6)	(59.7)	(59.1)	(54.1)	(46.9)
with lift cylinders 2 x 100 mm					
Hitch point distance to ground level in. (mm)	7.9 (201)	16.1 (409)	24.0 (609)	31.9 (810)	40.0 (1017)
Lift force on frame lb	18660	18544	17958	16558	14432
" " " " " " (kN)	(83.0)	(82.5)	(79.9)	(73.7)	(64.2)

	OECD test		SAE test	
	inch	mm	inch	mm
A	29.6	752	26.4	670
B	16.7	425	16.7	425
C	25.6	650	25.6	650
D	23.9	608	23.9	608
E	11.1	283	7.5	190
F	12.7	323	12.7	323
G	35.6	905	35.6	905
H	4.7	120	4.7	120
I	20.9	530	20.6	523
J	22.9	582	22.9	582
K	28.1	713	27.8	706
L	51.2	1300	47.4	1204
*L'	--	--	50.9	1293
M	24.7	628	20.9	532
N	44.1	1120	40.3	1024
O	9.0	230	8.0	203
P	50.2	1275	45.2	1149
Q	40.4	1025	37.6	954
R	38.4	975	39.8	1010

\*L' to Quick Attach ends



JOHN DEERE 7630 DIESEL