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2012

## Test 2022: John Deere 7230R

Nebraska Tractor Test Lab

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

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# NEBRASKA OECD TRACTOR TEST 2022–SUMMARY 821

## JOHN DEERE 7230R COMMANDQUAD 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
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1077 rpm)					
193.37 (144.19)	2100	11.18 (42.34)	0.407 (0.247)	17.29 (3.41)	
Standard Power Take-off Speed (1000 rpm)					
216.63 (161.54)	1950	11.98 (45.35)	0.389 (0.237)	18.08 (3.56)	
Maximum Power (1 hour)					
225.07 (167.83)	1701	12.03 (45.54)	0.376 (0.229)	18.71 (3.69)	

#### VARYING POWER AND FUEL CONSUMPTION

193.37 (144.19)	2100	11.18 (42.34)	0.407 (0.247)	17.29 (3.41)	Air temperature
168.05 (125.31)	2155	10.20 (38.61)	0.427 (0.260)	16.47 (3.25)	76°F (24°C)
126.40 (94.26)	2163	8.69 (32.88)	0.483 (0.294)	14.55 (2.87)	Relative humidity
84.40 (62.94)	2173	6.97 (26.39)	0.581 (0.353)	12.11 (2.38)	56%
41.95 (31.28)	2180	5.38 (20.36)	0.902 (0.549)	7.80 (1.54)	Barometer
2.10 (1.57)	2187	4.33 (16.38)	14.490 (8.814)	0.49 (0.10)	28.45" Hg (96.34 kPa)

Maximum torque - 724 lb.-ft. (982 Nm) at 1601 rpm

Maximum torque rise - 49.6%

Torque rise at 1701 engine rpm - 43%

Power increase at 1701 engine rpm - 16.4%

#### 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—7th (B3) Gear									
179.34 (133.73)	12959 (57.64)	5.19 (8.35)	2100	2.4	0.447 (0.272)	15.73 (3.10)	215 (102)	63 (17)	28.82 (97.60)
75% of Pull at Maximum Power—7th (B3) Gear									
140.05 (104.44)	9760 (43.41)	5.38 (8.66)	2157	1.6	0.494 (0.301)	14.23 (2.80)	216 (102)	69 (20)	28.79 (97.50)
50% of Pull at Maximum Power—7th (B3) Gear									
96.61 (72.04)	6669 (29.66)	5.44 (8.75)	2168	1.1	0.587 (0.357)	11.99 (2.36)	215 (101)	68 (20)	28.78 (97.47)
75% of Pull at Reduced Engine Speed—10th (C2) Gear									
139.85 (104.28)	9730 (43.28)	5.39 (8.67)	1628	1.6	0.431 (0.262)	16.30 (3.21)	210 (99)	68 (20)	28.79 (97.50)
50% of Pull at Reduced Engine Speed—10th (C2) Gear									
96.67 (72.09)	6617 (29.43)	5.48 (8.82)	1646	1.0	0.467 (0.284)	15.07 (2.97)	210 (99)	69 (20)	28.77 (97.44)

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

**Dates of tests:** May 1-15, 2012

**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) 0.8448 Fuel weight 7.034 lbs/gal (0.843 kg/l) Oil SAE 15W-40 API service classification CJ-4 Transmission and hydraulic lubricant John Deere Hy-Gard fluid Front axle lubricant John Deere Hy-Gard fluid Total time engine was operated: 19.0 hours

**ENGINE: Make** John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** \*RG6090R015877\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.661 x 5.354" (118.4 mm x 136.0 mm) **Compression ratio** 16.2 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 prestrainer **Fuel cooler** radiator for pump return fuel **Muffler** vertical **Cooling medium temperature control** thermostat and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 75.0 - 81.1 lb/h (34.0 - 36.8 kg/h) **High idle:** 2150 - 2250 rpm **Turbo boost:** nominal 16.0 - 18.9 psi (110 - 130 kPa) as measured 17.6 psi (121 kPa)

**CHASSIS: Type** front wheel assist with duals **Serial No.** \*1RW7230RCCC005154\* **Tread width** rear 60.0" (1524 mm) to 128.9" (3272 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) **Wheelbase** 115.2" (2925 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 1.74 (2.80) second 2.09 (3.37) third 2.51 (4.03) fourth 3.07 (4.94) fifth 3.68 (5.93) sixth 4.43 (7.14) seventh 5.31 (8.55) eighth 5.86 (9.43) ninth 6.51 (10.47) tenth 7.06 (11.36) eleventh 8.45 (13.60) twelfth 10.35 (16.66) thirteenth 10.85 (17.46) fourteenth 13.06 (21.03) fifteenth 15.65 (25.18) sixteenth 19.17 (30.85) seventeenth 19.80 (31.86) eighteenth 23.84 (38.37) nineteenth 26.72 (43.00) twentieth 26.72 (43.00) electronically limited reverse 1.81 (2.92), 2.18 (3.51), 2.61 (4.21), 3.20 (5.15), 3.84 (6.18), 4.63 (7.45), 5.54 (8.91), 6.11 (9.84), 6.79 (10.93), 7.36 (11.85), 8.82 (14.19), 10.81 (17.39), 11.32 (18.22), 13.63 (21.94), 16.33 (26.28), 20.00 (32.19), 20.66 (33.25), 24.87 (40.03), 26.72 (43.00), 26.72 (43.00) electronically limited

# **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)
3rd(A3) Gear									
135.50 (101.04)	21678 (96.43)	2.35 (3.77)	2156	9.0	0.534 (0.325)	13.18 (2.60)	209 (98)	53 (11)	28.86 (97.74)
4th(A4) Gear									
157.92 (117.76)	21004 (93.43)	2.82 (4.54)	2119	8.9	0.501 (0.305)	14.05 (2.77)	214 (101)	58 (14)	28.86 (97.74)
5th(B1) Gear									
173.44 (129.33)	18541 (82.47)	3.51 (5.65)	2100	4.9	0.461 (0.280)	15.27 (3.01)	212 (100)	60 (15)	28.87 (97.77)
6th(B2) Gear									
176.49 (131.61)	15377 (68.40)	4.31 (6.93)	2100	3.1	0.453 (0.276)	15.53 (3.06)	215 (101)	62 (17)	28.83 (97.64)
7th(B3) Gear									
179.34 (133.73)	12959 (57.64)	5.19 (8.35)	2100	2.4	0.447 (0.272)	15.73 (3.10)	215 (102)	63 (17)	28.82 (97.60)
8th(C1) Gear									
177.91 (132.66)	11606 (51.62)	5.75 (9.25)	2100	2.0	0.445 (0.271)	15.80 (3.11)	215 (102)	65 (18)	28.81 (97.57)
9th(B4) Gear									
176.94 (131.94)	10360 (46.08)	6.41 (10.31)	2100	1.8	0.447 (0.272)	15.73 (3.10)	215 (102)	64 (18)	28.81 (97.57)
10th(C2) Gear									
177.19 (132.13)	9554 (42.50)	6.96 (11.19)	2101	1.6	0.451 (0.274)	15.59 (3.07)	216 (102)	67 (19)	28.81 (97.57)
11th(C3) Gear									
179.04 (133.51)	8027 (35.70)	8.37 (13.46)	2100	1.3	0.450 (0.274)	15.64 (3.08)	216 (102)	67 (19)	28.82 (97.60)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 6th (B2) gear	70.3	70.2
Transport speed - no load - 19th (E3) gear	70.8	70.8
Bystander in 19th (E3) gear	82.9	82.9

## **TIRES AND WEIGHT**

**Rear Tires** - No., size, ply & psi(kPa)  
**Front Tires** - No., size, ply & psi(kPa)  
**Height of Drawbar**  
**Static Weight with operator** - Rear  
- Front  
- Total

## **Tested Without Ballast**

Four 480/80R46;\*\*\*;12(85)  
Two 16.9R30;\*\*\*;18(125)  
18.5 in (470 mm)  
14005 lb (6352 kg)  
7960 lb (3611 kg)  
21965 lb (9963 kg)

**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 1958 engine rpm or 1000 rpm at 1950 engine rpm **Unladen tractor mass** 21790 lb (9884 kg)

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

**NOTE 1:** During testing the engine was operated for 19.0 hours. During this period, the tractor experienced one active exhaust filter cleaning while operated in Auto Filter Cleaning Mode. This occurred after 16.5 hours of operation.

**NOTE 2:** The manufacturer declared that the active exhaust filter cleanings consume an average of 0.04 gal/hr (0.15 l/hr) across total tractor use. Fuel consumed during the active exhaust filter cleanings will normally be less than 1% of the total fuel consumed. The manufacturer declared that no active exhaust filter cleanings occurred during 12 hours of continuous operation of the tractor in the Auto Filter Cleaning Mode at 30% loading and the engine speed at which the maximum torque occurs.

**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 127°F (53°C). The pull in 3<sup>rd</sup> (A3) gear was limited to avoid excessive tractor power hop. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2022**, Nebraska Summary 821, October 2, 2012.

Roger M. Hoy  
Director

M.A. Hanna  
P.J. Jasa  
J.D. Luck  
Board of Tractor Test Engineers

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED - 1700 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									
135.74 (101.22)	21804 (96.99)	2.33 (3.75)	2155	9.3	0.528 (0.321)	13.33 (2.63)	208 (98)	53 (12)	28.86 (97.74)
4th(A4)Gear									
158.52 (118.20)	21148 (94.07)	2.81 (4.52)	2113	9.1	0.500 (0.304)	14.08 (2.77)	212 (100)	57 (14)	28.86 (97.74)
5th(B1)Gear									
179.61 (133.94)	20137 (89.57)	3.35 (5.38)	2043	6.7	0.462 (0.281)	15.23 (3.00)	214 (101)	60 (16)	28.86 (97.74)
6th(B2)Gear									
195.23 (145.58)	19200 (85.40)	3.81 (6.13)	1903	5.2	0.445 (0.271)	15.80 (3.11)	216 (102)	63 (17)	28.82 (97.60)
7th(B3)Gear									
202.33 (150.88)	18168 (80.82)	4.18 (6.73)	1726	4.4	0.424 (0.258)	16.58 (3.27)	216 (102)	64 (18)	28.82 (97.60)
8th(C1)Gear									
203.99 (152.12)	16691 (74.25)	4.59 (7.38)	1700	3.6	0.421 (0.256)	16.70 (3.29)	217 (103)	66 (19)	28.81 (97.57)
9th(B4)Gear									
204.13 (152.22)	14957 (66.53)	5.12 (8.24)	1700	2.9	0.418 (0.254)	16.84 (3.32)	216 (102)	65 (18)	28.82 (97.60)
10th(C2)Gear									
204.51 (152.50)	13778 (61.29)	5.57 (8.96)	1700	2.5	0.418 (0.254)	16.81 (3.31)	217 (103)	67 (19)	28.81 (97.57)
11th(C3)Gear									
205.91 (153.54)	11501 (51.16)	6.72 (10.81)	1700	2.0	0.416 (0.253)	16.91 (3.33)	216 (102)	67 (19)	28.82 (97.60)
12th(C4)Gear									
204.07 (152.17)	9268 (41.22)	8.26 (13.29)	1701	1.6	0.419 (0.255)	16.77 (3.30)	216 (102)	67 (19)	28.81 (97.57)

## HYDRAULIC PERFORMANCE

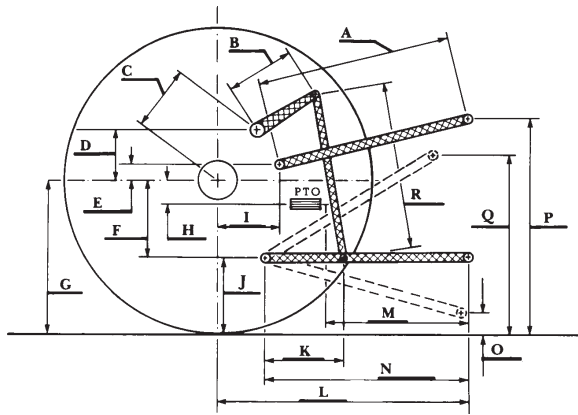
CATEGORY: III

Quick Attach: Yes

OECD Static test

	<u>lift cylinders</u>		
Maximum force exerted through whole range:	12408 lbs (55.2 kN) (2 x 90 mm)		
	15324 lbs (68.2 kN) (2 x 100 mm)		
	<u>45 cc pump</u>	<u>63 cc pump</u>	<u>85 cc pump</u>
i) Sustained pressure at compensator cutoff:	2944 psi (203 bar)	2899 psi (200 bar)	2943 psi (203 bar)
	<u>three outlet sets combined</u>		
ii) Pump delivery rate at minimum pressure and rated engine speed:	36.0 GPM (136.4 l/min)	47.0 GPM (177.9 l/min)	62.4 GPM (236.2 l/min)
iii) Pump delivery rate at maximum hydraulic power:	34.9 GPM (132.3 l/min)	46.3 GPM (175.2 l/min)	61.6 GPM (233.3 l/min)
Delivery pressure:	2815 psi (194 bar)	2663 psi (184 bar)	2542 psi (175 bar)
Power:	57.4 HP (42.8 kW)	71.9 HP (53.6 kW)	91.4 HP (68.1 kW)
	<u>single outlet set</u>		
ii) Pump delivery rate at minimum pressure and rated engine speed:	35.6 GPM (134.8 l/min)	37.2 GPM (140.8 l/min)	38.4 GPM (145.5 l/min)
iii) Pump delivery rate at maximum hydraulic power:	35.3 GPM (133.6 l/min)	37.1 GPM (140.6 l/min)	38.0 GPM (143.8 l/min)
Delivery pressure:	2364 psi (163 bar)	2134 psi (147 bar)	2239 psi (154 bar)
Power:	48.7 HP (36.3 kW)	46.2 HP (34.5 kW)	49.6 HP (37.0 kW)

## HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	28.5	725
B	20.5	520
C	21.7	551
D	18.9	480
E	7.3	185
F	14.4	365
G	37.4	950
H	3.5	90
I	20.7	525
J	23.0	585
K	29.3	745
L	50.2	1276
*L'	54.3	1378
M	27.0	687
N	39.4	1000
O	9.0	230
P	50.6	1284
Q	40.0	1015
R	44.3	1125

\*L' to Quick Attach ends



## JOHN DEERE 7230R DIESEL

Institute of Agriculture and Natural Resources  
University of Nebraska–Lincoln