

# NEBRASKA OECD TRACTOR TEST 1963—SUMMARY 660

## JOHN DEERE 8320R DIESEL

### 16 SPEED

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

**Dates of tests:** October 13 - 28, 2009

**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) 0.8445 Fuel weight 7.032 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: 41.5 hours

**ENGINE: Make** John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** \*RG6090L068192\* **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:** 99.9 - 108.0 lb/h (45.3 - 49.0 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 26.1 - 29.0 psi (180 - 200 kPa) as measured 27.4 psi (189 kPa)

**CHASSIS: Type** front wheel assist with duals **Serial No.** \*RW8320R002220\* **Tread width** rear 60.0" (1524 mm) to 132.6" (3368 mm) front 64.0" (1626 mm) to 88.0" (2235 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 1.17 (1.88) second 1.57 (2.52) third 2.09 (3.36) fourth 2.80 (4.50) fifth 3.14 (5.05) sixth 3.62 (5.82) seventh 4.20 (6.76) eighth 4.84 (7.79) ninth 5.59 (9.00) tenth 6.45 (10.38) eleventh 7.49 (12.06) twelfth 8.64 (13.90) thirteenth 10.17 (16.38) fourteenth 13.63 (21.94) fifteenth 18.15 (29.21) sixteenth 24.31 (39.13) reverse 1.09 (1.76), 2.93 (4.72), 3.70 (5.96), 6.80 (10.95) @ 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** 25710 lb (11662 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
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed—(PTO speed—1048 rpm)</b>					
274.37 (204.60)	2100	14.50 (54.88)	0.372 (0.226)	18.93 (3.73)	
<b>Standard Power Take-off Speed(1000 rpm)</b>					
298.64 (222.69)	2004	15.75 (59.63)	0.371 (0.226)	18.96 (3.73)	
<b>Maximum Power (1 hour)</b>					
307.31 (229.16)	1650	16.18 (61.27)	0.370 (0.225)	18.99 (3.74)	

#### VARYING POWER AND FUEL CONSUMPTION

274.37 (204.60)	2100	14.50 (54.88)	0.372 (0.226)	18.93 (3.73)	Air temperature
239.23 (178.39)	2151	13.19 (49.94)	0.388 (0.236)	18.13 (3.57)	73°F (23°C)
180.25 (134.41)	2162	10.73 (40.63)	0.419 (0.255)	16.79 (3.31)	Relative humidity
120.88 (90.14)	2174	7.90 (29.90)	0.460 (0.280)	15.30 (3.01)	34%
60.75 (45.30)	2187	5.52 (20.90)	0.639 (0.389)	11.00 (2.17)	Barometer
1.85 (1.38)	2197	3.41 (12.90)	12.920 (7.859)	0.54 (0.11)	28.54" Hg (96.65 kPa)

Maximum Torque - 1014 lb.-ft. (1375 Nm) at 1501 rpm  
Maximum Torque Rise - 47.7%  
Torque rise at 1700 engine rpm - 38%  
Power increase at 1650 rpm - 12.0%

#### 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—9th Gear</b>									
242.32 (180.69)	16404 (72.97)	5.54 (8.92)	2097	4.2	0.426 (0.259)	16.53 (3.26)	192 (89)	45 (7)	29.06 (98.41)
<b>75% of Pull at Maximum Power—9th Gear</b>									
188.99 (140.93)	12314 (54.78)	5.76 (9.26)	2156	3.0	0.466 (0.283)	15.11 (2.98)	187 (86)	51 (11)	29.03 (98.31)
<b>50% of Pull at Maximum Power—9th Gear</b>									
128.37 (95.73)	8228 (36.60)	5.85 (9.41)	2169	2.1	0.498 (0.303)	14.12 (2.78)	180 (82)	51 (11)	29.02 (98.27)
<b>75% of Pull at Reduced Engine Speed—12th Gear</b>									
186.66 (139.19)	12317 (54.79)	5.68 (9.14)	1377	3.0	0.395 (0.240)	17.84 (3.51)	199 (93)	51 (11)	29.03 (98.31)
<b>50% of Pull at Reduced Engine Speed—12th Gear</b>									
128.45 (95.79)	8222 (36.58)	5.86 (9.42)	1408	1.9	0.422 (0.257)	16.67 (3.28)	180 (82)	51 (11)	29.02 (98.27)

**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)
					<b>5th Gear</b>				
186.37 (138.97)	23566 (104.83)	2.97 (4.77)	2154	12.0	0.485 (0.295)	14.52 (2.86)	193 (89)	69 (21)	28.70 (97.19)
					<b>6th Gear</b>				
210.08 (156.66)	23052 (102.54)	3.42 (5.50)	2142	11.4	0.474 (0.288)	14.86 (2.93)	203 (95)	70 (21)	28.70 (97.19)
					<b>7th Gear</b>				
229.52 (171.15)	21441 (95.37)	4.02 (6.46)	2098	8.0	0.450 (0.274)	15.64 (3.08)	205 (96)	70 (21)	28.70 (97.19)
					<b>8th Gear</b>				
239.59 (178.66)	18865 (83.92)	4.77 (7.67)	2099	5.2	0.426 (0.259)	16.55 (3.26)	191 (88)	50 (10)	29.04 (98.34)
					<b>9th Gear</b>				
242.32 (180.69)	16404 (72.97)	5.54 (8.92)	2097	4.2	0.426 (0.259)	16.53 (3.26)	192 (89)	45 (7)	29.06 (98.41)
					<b>10th Gear</b>				
243.66 (181.69)	14217 (63.24)	6.43 (10.34)	2096	3.3	0.417 (0.254)	16.88 (3.33)	191 (89)	45 (7)	29.06 (98.41)
					<b>11th Gear</b>				
237.86 (177.37)	11833 (52.63)	7.54 (12.13)	2102	2.7	0.428 (0.260)	16.45 (3.24)	195 (90)	46 (8)	29.05 (98.37)
					<b>12th Gear</b>				
237.64 (177.21)	10202 (45.38)	8.74 (14.06)	2100	2.1	0.430 (0.262)	16.35 (3.22)	194 (90)	48 (9)	29.05 (98.37)

**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 121°F (50°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. **1963**, Nebraska Summary 660, December 2, 2009.

Roger M. Hoy  
Director

M.F. Kocher  
V.I. Adamchuk  
J.A. Smith  
Board of Tractor Test Engineers

<b>TRACTOR SOUND LEVEL WITH CAB</b>	<b>Front Wheel Drive</b>	
	<b>Engaged dB(A)</b>	<b>Disengaged dB(A)</b>
At no load in 8th gear	70.9	70.9
Transport speed-no load-16th gear	74.0	74.0
Bystander in 16th gear	85.6	85.6

**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 480/80R50;\*\*\*;11(75)  
 Two 420/85R34;\*\*\*;26 (180)  
 20.5 in (520 mm)  
 15610 lb (7080 kg)  
 10275 lb (4661 kg)  
 25885 lb(11741 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED-FRONT DRIVE ENGAGED - 1650 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)
5th Gear									
186.55 (139.11)	23682 (105.34)	2.96 (4.76)	2154	13.0	0.487 (0.296)	14.45 (2.85)	194 (90)	69 (21)	28.70 (97.19)
6th Gear									
210.62 (157.06)	23071 (102.63)	3.42 (5.50)	2140	11.2	0.472 (0.287)	14.90 (2.94)	203 (95)	70 (21)	28.70 (97.19)
7th Gear									
235.26 (175.43)	22773 (101.30)	3.88 (6.24)	2062	10.1	0.453 (0.276)	15.53 (3.06)	202 (94)	71 (22)	28.70 (97.19)
8th Gear									
253.81 (189.26)	21985 (97.80)	4.33 (6.97)	1970	8.4	0.447 (0.272)	15.74 (3.10)	205 (96)	72 (22)	28.70 (97.19)
9th Gear									
269.08 (200.65)	20946 (93.17)	4.82 (7.76)	1867	6.5	0.425 (0.258)	16.56 (3.26)	204 (95)	45 (7)	29.06 (98.41)
10th Gear									
274.15 (204.43)	20045 (89.17)	5.13 (8.26)	1709	5.7	0.416 (0.253)	16.90 (3.33)	204 (95)	45 (7)	29.06 (98.41)
11th Gear									
274.81 (204.92)	17654 (78.53)	5.84 (9.39)	1656	4.5	0.420 (0.256)	16.74 (3.30)	202 (94)	45 (7)	29.05 (98.37)
12th Gear									
276.62 (206.28)	15254 (67.85)	6.80 (10.94)	1659	3.4	0.414 (0.252)	16.98 (3.35)	201 (94)	47 (8)	29.05 (98.37)
13th Gear									
276.35 (206.07)	12855 (57.18)	8.06 (12.97)	1658	2.7	0.417 (0.253)	16.89 (3.33)	203 (95)	50 (10)	29.04 (98.34)

## HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range: 18326 lbs (81.5 kN)

i) Sustained pressure at compensator cutoff: 2963 psi (204 bar)  
**three outlet sets combined**

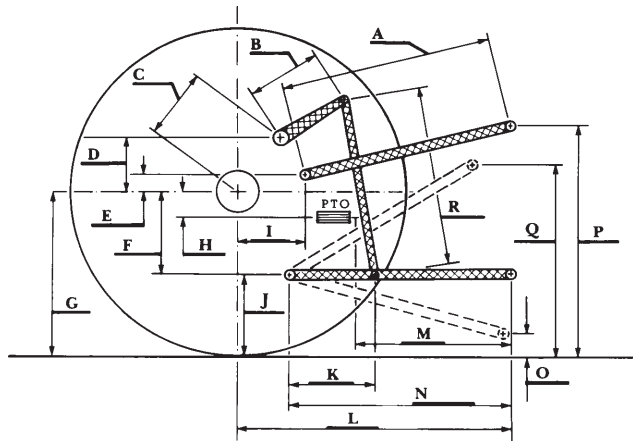
ii) Pump delivery rate at minimum pressure and rated engine speed: 64.1 GPM (242.6 l/min)

iii) Pump delivery rate at maximum hydraulic power: 63.7 GPM (241.1 l/min)  
Delivery pressure: 2488 psi (171 bar)  
Power: 92.4 HP (68.9 kW)  
**single outlet set**

ii) Pump delivery rate at minimum pressure and rated engine speed: 40.9 GPM (154.8 l/min)

iii) Pump delivery rate at maximum hydraulic power: 39.6 GPM (149.9 l/min)  
Delivery pressure: 2129 psi (147 bar)  
Power: 49.2 HP (36.7 kW)

### 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



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