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Test 1963: John Deere 8320R Diesel

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1963—SUMMARY 660

JOHN DEERE 8320R DIESEL

16 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—1048 rpm)					
274.37 (204.60)	2100	14.50 (54.88)	0.372 (0.226)	18.93 (3.73)	
Standard Power Take-off Speed(1000 rpm)					
298.64 (222.69)	2004	15.75 (59.63)	0.371 (0.226)	18.96 (3.73)	
Maximum Power (1 hour)					
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)
Maximum Power—9th Gear									
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)
75% of Pull at Maximum Power—9th Gear									
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)
50% of Pull at Maximum Power—9th Gear									
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)
75% of Pull at Reduced Engine Speed—12th Gear									
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)
50% of Pull at Reduced Engine Speed—12th Gear									
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)

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)

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

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

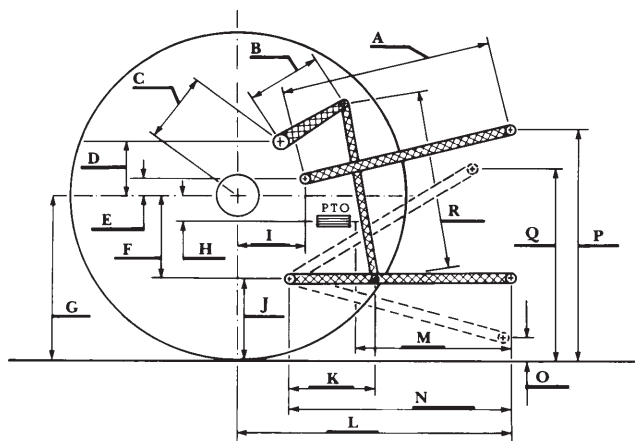
single outlet set

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



JOHN DEERE 8320R DIESEL