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Test 1625: John Deere 8960 Powersync Diesel 12 and 24-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1625—SUMMARY 063

JOHN DEERE 8960 POWRSYNC DIESEL

24 SPEED ALSO 12 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—1002 rpm)					
333.40 (248.61)	1900	19.52 (73.88)	0.405 (0.246)	17.08 (3.36)	
Maximum Power (2 Hours)					
335.34 (250.06)	1800	19.24 (72.84)	0.397 (0.241)	17.43 (3.43)	

VARYING POWER AND FUEL CONSUMPTION

333.40 (248.61)	1900	19.52 (73.88)	0.405 (0.246)	17.08 (3.36)	Air temperature
300.45 (224.05)	2016	18.62 (70.48)	0.428 (0.261)	16.14 (3.18)	77°F (25°C)
230.06 (171.56)	2059	15.41 (58.33)	0.463 (0.282)	14.93 (2.94)	Relative humidity
155.12 (115.67)	2077	11.50 (43.54)	0.513 (0.312)	13.49 (2.66)	22%
78.21 (58.32)	2099	8.72 (33.02)	0.771 (0.469)	8.97 (1.77)	Barometer
0.54 (0.40)	2139	5.30 (20.04)	68.105 (41.427)	0.10 (0.02)	29.08" Hg (98.48 kPa)

Maximum Torque 1268 lb.-ft (1719 Nm) at 1248 rpm

Maximum Torque Rise 37.6%

Torque Rise at 1000 engine rpm 28%

DRAWBAR PERFORMANCE

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—10th (B3) Gear									
308.26 (229.87)	19700 (87.63)	5.87 (9.44)	1898	2.22	0.431 (0.262)	16.03 (3.16)	186 (86)	68 (20)	28.92 (97.93)
75% of Pull at Maximum Power—10th (B3) Gear									
250.39 (186.71)	14792 (65.80)	6.35 (10.22)	2044	1.86	0.485 (0.295)	14.26 (2.81)	186 (86)	77 (25)	28.84 (97.66)
50% of Pull at Maximum Power—10th (B3) Gear									
170.33 (127.02)	9851 (43.82)	6.48 (10.44)	2075	1.22	0.551 (0.335)	12.55 (2.47)	181 (83)	77 (25)	28.82 (97.60)
75% of Pull at Reduced Engine Speed—13th (B4) Gear									
249.73 (186.22)	14765 (65.68)	6.34 (10.21)	1703	1.68	0.432 (0.263)	16.01 (3.15)	186 (86)	77 (25)	28.84 (97.66)
50% of Pull at Reduced Engine Speed—13th (B4) Gear									
170.63 (127.24)	9859 (43.86)	6.49 (10.45)	1732	1.31	0.488 (0.297)	14.16 (2.79)	182 (83)	79 (26)	28.81 (97.56)

Location of Test: Center for Agricultural Equipment, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: May-June, 1989

Manufacturer: John Deere Waterloo Works, P.O. Box 3500, Waterloo, Iowa 50704

FUEL OIL and TIME: Fuel No. 2 Diesel Cetane No. 51.1 Specific gravity converted to 60°/60°F (15°/15°C) 0.8301 Fuel weight 6.912 lbs/gal (0.828 kg/l) Oil SAE 15W40 API service classification CD/SD To motor 7.757 gal (29.362 l) Drained from motor 7.249 gal (27.442 l) Transmission, hydraulic and final drive lubricant John Deere HyGard fluid Total time engine was operated 31.5 hours.

ENGINE: Make Cummins Diesel Type six cylinder vertical with turbocharger and intercooler Serial No. 11511016 Crankshaft lengthwise Rated engine speed 1900 Bore and stroke (as specified) 5.50" × 6.00" (139.7 mm × 152.4 mm) Compression ratio 14.0 to 1 Displacement 855 cu in (14011 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements and aspirator Oil filter two full flow cartridges Oil cooler engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil Fuel filter one paper cartridge Fuel cooler radiator for injection pump return fuel Muffler vertical Cooling medium temperature control one thermostat and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 130.2-142.1 lb/hr (59.0-64.5 kg/hr) High idle 2080-2180 rpm Turbo boost nominal 19-23 psi (131-159 kPa) as measured 21.5 psi (148 kPa).

CHASSIS: Type four wheel drive with duals Serial No. *RW8960H001019* Tread width rear 78.8" (2002 mm) to 144.1" (3659 mm) front 78.8" (2002 mm) to 144.1" (3659 mm) Wheel base 133.9" (3400 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio with partial (2) range operator controlled powershift Nominal travel speeds mph (km/h) first 2.19 (3.53) second 2.63 (4.23) third 2.82 (4.54) fourth 3.38 (5.45) fifth 3.86 (6.22) sixth 4.63 (7.45) seventh 4.67 (7.52) eighth 5.15 (8.29) ninth 5.60 (9.01) tenth 6.01 (9.68) eleventh 6.18 (9.94) twelfth 6.63 (10.67) thirteenth 7.21 (11.60) fourteenth 7.95 (12.79) fifteenth 8.23 (13.25) sixteenth 9.08 (14.60) seventeenth 9.87 (15.89) eighteenth 10.88 (17.51) nineteenth 10.97 (17.66) twentieth 13.16 (21.18) twenty-first 14.13 (22.77) twenty-second 16.95 (27.27) twenty-third 19.34 (31.12) twenty-fourth 23.19 (37.32) reverse 2.63 (4.23), 3.15 (5.07), 5.60 (9.01), 6.18 (9.94), 6.72 (10.81), 7.41 (11.92) Clutch multiple wet disc hydraulically power actuated by foot pedal Brakes multiple wet disc hydraulically

DRAWBAR PERFORMANCE AT 1800 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)
4th (A4) Gear									
278.85 (207.94)	34462 (153.29)	3.03 (4.88)	1883	9.25	0.472 (0.287)	14.64 (2.88)	186 (85)	69 (21)	28.94 (98.00)
5th (A5) Gear									
286.38 (213.56)	30187 (134.28)	3.56 (5.73)	1861	5.87	0.456 (0.277)	15.16 (2.99)	186 (86)	73 (23)	28.92 (97.93)
6th (A6) Gear									
293.96 (219.21)	26288 (116.93)	4.19 (6.73)	1799	4.34	0.442 (0.269)	15.63 (3.08)	187 (86)	76 (24)	28.92 (97.93)
7th (B1) Gear									
301.53 (224.85)	26611 (118.37)	4.25 (6.84)	1800	3.90	0.432 (0.263)	16.02 (3.16)	186 (85)	70 (21)	28.87 (97.77)
8th (C1) Gear									
300.12 (223.80)	23972 (106.63)	4.69 (7.56)	1796	3.47	0.434 (0.264)	15.94 (3.14)	187 (86)	76 (24)	28.80 (97.53)
9th (B2) Gear									
304.72 (227.23)	22208 (98.78)	5.15 (8.28)	1800	3.02	0.427 (0.260)	16.18 (3.19)	190 (88)	76 (24)	28.81 (97.56)
10th (B3) Gear									
310.49 (231.53)	20988 (93.36)	5.55 (8.93)	1799	2.49	0.423 (0.257)	16.35 (3.22)	188 (86)	68 (20)	28.92 (97.93)
11th (C2) Gear									
301.82 (225.06)	19858 (88.33)	5.70 (9.17)	1800	2.49	0.429 (0.261)	16.12 (3.18)	187 (86)	70 (21)	28.88 (97.80)
12th (C3) Gear									
307.52 (229.31)	18772 (83.50)	6.14 (9.89)	1803	2.22	0.423 (0.257)	16.34 (3.22)	187 (86)	72 (22)	28.87 (97.77)
13th (B4) Gear									
305.09 (227.51)	17080 (75.98)	6.70 (10.78)	1803	2.04	0.425 (0.259)	16.25 (3.20)	188 (87)	73 (23)	28.85 (97.70)
14th (C4) Gear									
305.04 (227.47)	15482 (68.87)	7.39 (11.89)	1799	1.86	0.427 (0.260)	16.18 (3.19)	190 (88)	74 (23)	28.84 (97.66)
15th (B5) Gear									
306.49 (228.55)	14986 (66.66)	7.67 (12.34)	1802	1.68	0.425 (0.259)	16.25 (3.20)	188 (87)	74 (23)	28.83 (97.63)
16th (C5) Gear									
304.70 (227.21)	13481 (59.96)	8.48 (13.64)	1803	1.49	0.427 (0.260)	16.17 (3.19)	188 (87)	76 (24)	28.82 (97.60)

power actuated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1003 rpm at 1900 engine rpm **Unladen tractor mass** 35570 lb (16134 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 102° F (39° C). This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. The pull in 3rd (A3) and 4th (A4) gears was limited to avoid tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1625**, Summary 063, December 22, 1989.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

R. D. GRISSO

G. J. HOFFMAN

Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 1900 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd (A3) Gear									
248.00 (184.93)	34316 (152.64)	2.71 (4.36)	2025	9.87	0.500 (0.304)	13.83 (2.72)	185 (85)	70 (21)	28.93 (97.97)
4th (A4) Gear									
281.10 (209.62)	33574 (149.34)	3.14 (5.05)	1898	7.02	0.471 (0.286)	14.69 (2.89)	186 (85)	64 (18)	28.94 (98.00)
5th (A5) Gear									
287.55 (214.43)	29577 (131.57)	3.65 (5.87)	1898	5.45	0.465 (0.283)	14.88 (2.93)	186 (85)	71 (22)	28.93 (97.97)
6th (A6) Gear									
293.06 (218.53)	24764 (110.16)	4.44 (7.14)	1895	3.82	0.453 (0.276)	15.25 (3.00)	187 (86)	73 (23)	28.92 (97.93)
7th (B1) Gear									
303.49 (226.31)	25262 (112.37)	4.51 (7.25)	1898	3.47	0.440 (0.267)	15.72 (3.10)	186 (85)	74 (23)	28.86 (97.73)
8th (C1) Gear									
299.47 (223.31)	22541 (100.27)	4.98 (8.02)	1899	3.20	0.444 (0.270)	15.58 (3.07)	187 (86)	77 (25)	28.80 (97.53)
9th (B2) Gear									
302.33 (225.45)	20826 (92.64)	5.44 (8.76)	1897	2.49	0.439 (0.267)	15.74 (3.10)	187 (86)	68 (20)	28.91 (97.90)
10th (B3) Gear									
308.26 (229.87)	19700 (87.63)	5.87 (9.44)	1898	2.22	0.431 (0.262)	16.03 (3.16)	186 (86)	68 (20)	28.92 (97.93)
11th (C2) Gear									
298.67 (222.72)	18552 (82.52)	6.04 (9.72)	1901	2.13	0.444 (0.270)	15.57 (3.07)	187 (86)	70 (21)	28.89 (97.83)
12th (C3) Gear									
301.98 (225.19)	17472 (77.72)	6.48 (10.43)	1898	2.13	0.437 (0.266)	15.80 (3.11)	187 (86)	72 (22)	28.86 (97.73)
13th (B4) Gear									
298.20 (222.37)	15815 (70.35)	7.07 (11.38)	1900	1.77	0.444 (0.270)	15.55 (3.06)	187 (86)	74 (23)	28.84 (97.66)
14th (C4) Gear									
299.52 (223.36)	14369 (63.92)	7.82 (12.58)	1901	1.68	0.444 (0.270)	15.58 (3.07)	187 (86)	74 (23)	28.83 (97.63)
15th (B5) Gear									
300.37 (223.98)	13922 (61.93)	8.09 (13.02)	1898	1.49	0.442 (0.269)	15.63 (3.08)	187 (86)	74 (23)	28.82 (97.60)

TRACTOR SOUND LEVEL WITH CAB

dB(A)

Gear closest to 4.7 mph (7.5 km/h)—7th (B1) Gear	74.0
Maximum sound level	77.0
Transport speed—no load—24th (D6) Gear	75.0
Bystander in 24th (D6) Gear	87.0

LUGGING ABILITY IN 12th (C3) GEAR

Crankshaft Speed rpm	1898	1712	1519	1333	1134	951
Pull—lbs (kN)	17472 (77.72)	19540 (86.92)	21692 (96.49)	23689 (105.37)	24113 (107.26)	22134 (98.46)
Increase in Pull %	0	12	24	36	38	27
Power—Hp (kW)	301.98 (225.19)	303.58 (226.38)	297.66 (221.97)	283.81 (211.64)	245.38 (182.98)	189.64 (141.42)
Speed—Mph (km/h)	6.48 (10.43)	5.83 (9.38)	5.15 (8.28)	4.49 (7.23)	3.82 (6.14)	3.21 (5.17)
Slip %	2.13	2.58	2.76	3.29	3.47	3.11

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. (bar)	2540 (175)				
Location	remote outlet				
Hydraulic oil temperature °F(°C)	137 (58)				
Location	hydraulic sump				
Category	IV				
Quick attach	Yes				
Hitch point distance to ground level in. (mm)	9.0 (229)	16.2 (411)	26.4 (670)	38.4 (975)	46.0 (1168)
Lift force on frame lb. " " " " " " (kN)	15978 (71.1)	16368 (72.8)	16514 (73.5)	15334 (68.2)	13968 (62.1)

TIRES AND WEIGHT

Rear Tires	—No., size, ply & psi (kPa)
Front Tires	—No., size, ply & psi (kPa)
Height of Drawbar	
Static Weight	—Rear
	—Front
	—Total

Tested Without Ballast

Four 20.8R42; **, 14 (95)
Four 20.8R42; **, 14 (95)
20.0 in (510 mm)
15730 lb (7135 kg)
19840 lb (8999 kg)
35570 lb (16134 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: IV

Quick Attach: Yes

Maximum Force Exerted Through Whole Range:

12009 lbs (53.4 kN)

i) Opening pressure of relief valve:

NA

Sustained pressure with pump stalled:

2540 psi (175 Bar)

ii) Pump delivery rate at minimum pressure:

39.9 GPM (151.0 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

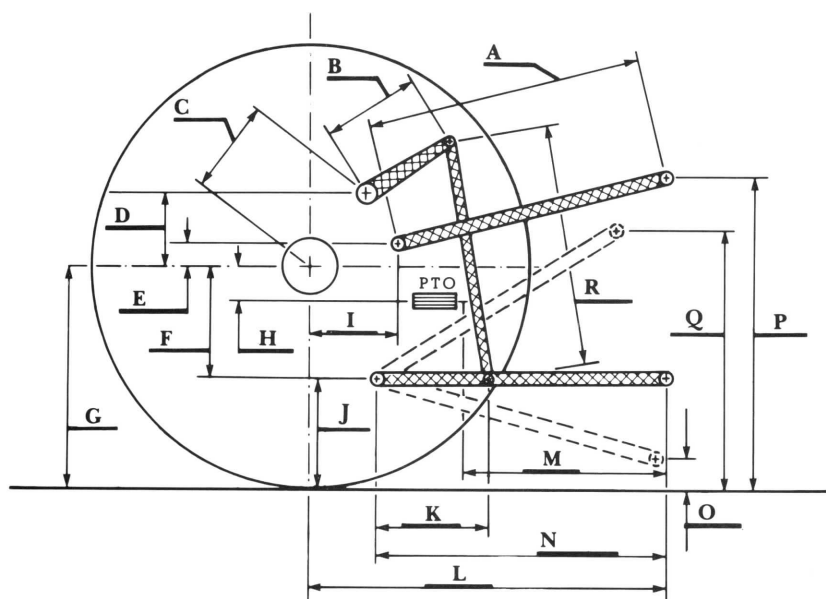
38.2 GPM (144.6 l/min)

Delivery pressure:

1950 psi (134 Bar)

Power:

43.5 Hp (32.4 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	31.0	787
B	18.6	472
C	26.2	666
D	24.4	620
E	11.3	288
F	13.8	350
G	36.1	918
H	4.8	122
I	22.7	577
J	22.3	568
K	28.3	718
L	54.5	1385
L'	60.5	1537
M	24.6	625
N	43.2	1097
O	8.9	226
P	49.3	1254
Q	40.9	1039
R	44.6	1133

L' to end of Quick attach



John Deere 8960 PowrSync Diesel

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