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Test 1621: John Deere 4755 and 4760 Powershift Diesel 15-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1621—SUMMARY 059

JOHN DEERE 4755 POWERSHIFT DIESEL

ALSO JOHN DEERE 4760 POWERSHIFT DIESEL

15 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
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MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—(PTO speed—998 rpm)					
177.06 (132.04)	2200	9.73 (36.82)	0.380 (0.231)	18.20 (3.59)	

Maximum Power (2 Hours)					
178.96 (133.45)	2050	9.61 (36.39)	0.371 (0.226)	18.62 (3.67)	

VARYING POWER AND FUEL CONSUMPTION

177.06 (132.04)	2200	9.73 (36.82)	0.380 (0.231)	18.20 (3.59)	Air temperature 78°F (25°C)
155.14 (115.69)	2263	8.85 (33.52)	0.394 (0.240)	17.52 (3.45)	
117.70 (87.77)	2292	7.16 (27.11)	0.421 (0.256)	16.44 (3.24)	Relative humidity 39%
79.51 (59.29)	2323	5.51 (20.87)	0.479 (0.291)	14.42 (2.84)	
40.16 (29.95)	2353	3.86 (14.62)	0.665 (0.404)	10.40 (2.05)	Barometer 28.74" Hg (97.33 kPa)
2.08 (1.55)	2375	2.30 (8.71)	7.651 (4.654)	0.90 (0.18)	

Maximum Torque 569 lb.-ft (771 Nm) at 1450 rpm

Maximum Torque Rise 34.5%

Torque Rise at 1000 engine rpm 12%

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—12th Gear									
147.76 (110.19)	6267 (27.88)	8.84 (14.23)	2201	2.43	0.455 (0.277)	15.19 (2.99)	186 (86)	58 (14)	29.07 (98.44)
75% of Pull at Maximum Power—12th Gear									
115.26 (85.95)	4697 (20.89)	9.20 (14.81)	2282	1.98	0.489 (0.297)	14.14 (2.78)	184 (84)	61 (16)	29.04 (98.34)
50% of Pull at Maximum Power—12th Gear									
78.04 (58.20)	3132 (13.93)	9.34 (15.04)	2305	1.52	0.569 (0.346)	12.15 (2.39)	181 (83)	58 (14)	29.04 (98.34)
75% of Pull at Reduced Engine Speed—13th Gear									
115.49 (86.12)	4707 (20.94)	9.20 (14.81)	1842	1.98	0.459 (0.279)	15.07 (2.97)	183 (84)	59 (15)	29.04 (98.34)
50% of Pull at Reduced Engine Speed—13th Gear									
78.12 (58.25)	3131 (13.93)	9.36 (15.06)	1865	1.52	0.519 (0.315)	13.33 (2.63)	181 (83)	58 (14)	29.04 (98.34)

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

Dates of Test: April-May, 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 4.915 gal (18.606 l) Drained from motor 4.667 gal (17.666 l) Transmission and hydraulic lubricant John Deere HyGard fluid Front axle lubricant John Deere GL-5 Gear Lubricant 85W-140 Total time engine was operated 28.0 hours.

ENGINE: Make John Deere Diesel Type six cylinder vertical with turbocharger and intercooler Serial No. *RG6076A102454* Crankshaft lengthwise Rated engine speed 2200 Bore and stroke (as specified) 4.56" × 4.75" (115.8 mm × 120.7 mm) Compression ratio 16.0 to 1 Displacement 466 cu in (7634 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements 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 prefilter Muffler vertical Cooling medium temperature control 2 thermostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 66.6-72.8 lb/hr (30.2-33.0 kg/hr) High idle 2350-2400 rpm Turbo boost nominal 16-19 psi (110-131 kPa) as measured 16.5 psi (114 kPa).

CHASSIS: Type front wheel assist Serial No. *RW4755P001033* Tread width rear 64.6" (1642 mm) to 115.7" (2938 mm) front 66.6" (1691 mm) to 87.8" (2230 mm) Wheel base 117.1" (2974 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio with full range operator controlled powershift Nominal travel speeds mph (km/h) first 1.42 (2.28) second 2.03 (3.27) third 2.45 (3.95) fourth 3.08 (4.96) fifth 3.55 (5.71) sixth 4.03 (6.49) seventh 4.64 (7.47) eighth 5.33 (8.58) ninth 6.14 (9.89) tenth 6.97 (11.22) eleventh 8.03 (12.93) twelfth 8.99 (14.46) thirteenth 11.12 (17.90) fourteenth 15.56 (25.04) fifteenth 19.25 (30.98) reverse 1.96 (3.16), 2.81 (4.52), 4.27 (6.87), 6.43 (10.34) Clutch multiple wet disc hydraulically power actuated by foot pedal Brakes multiple wet disc hydraulically power actuated by two foot pedals which can be locked together Steering hydrostatic Power take-off 998 rpm at 2200 engine rpm Unladen tractor mass 18165 lb (8239 kg).

**DRAWBAR PERFORMANCE AT 2050 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)
5th Gear									
133.33 (99.42)	16452 (73.18)	3.04 (4.89)	2192	14.78	0.502 (0.305)	13.77 (2.71)	184 (84)	55 (13)	29.13 (98.65)
6th Gear									
145.68 (108.64)	14852 (66.06)	3.68 (5.92)	2175	8.23	0.461 (0.281)	14.98 (2.95)	184 (84)	56 (13)	29.11 (98.58)
7th Gear									
149.31 (111.34)	13767 (61.24)	4.07 (6.55)	2051	6.59	0.444 (0.270)	15.55 (3.06)	184 (84)	56 (13)	29.10 (98.54)
8th Gear									
147.50 (109.99)	11613 (51.66)	4.76 (7.67)	2050	4.82	0.448 (0.273)	15.41 (3.04)	187 (86)	57 (14)	29.09 (98.51)
9th Gear									
148.21 (110.52)	10021 (44.58)	5.55 (8.93)	2052	4.04	0.447 (0.272)	15.48 (3.05)	187 (86)	58 (14)	29.08 (98.48)
10th Gear									
150.57 (112.28)	8929 (39.72)	6.32 (10.18)	2053	3.42	0.444 (0.270)	15.58 (3.07)	186 (86)	58 (14)	29.08 (98.48)
11th Gear									
148.54 (110.76)	7597 (33.79)	7.33 (11.80)	2053	2.88	0.446 (0.271)	15.51 (3.06)	186 (86)	58 (14)	29.07 (98.44)
12th Gear									
151.39 (112.89)	6901 (30.70)	8.23 (13.24)	2053	2.61	0.436 (0.265)	15.85 (3.12)	186 (86)	60 (16)	29.06 (98.41)
13th Gear									
146.82 (109.48)	5386 (23.96)	10.22 (16.45)	2053	2.16	0.449 (0.273)	15.41 (3.04)	186 (86)	61 (16)	29.05 (98.37)

**DRAWBAR PERFORMANCE AT 2050 RPM
MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR**

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 Gear									
131.75 (98.25)	21481 (95.55)	2.30 (3.70)	2262	9.38	0.491 (0.299)	14.07 (2.77)	185 (85)	55 (13)	29.02 (98.27)
4th Gear									
143.08 (106.70)	18882 (83.99)	2.84 (4.57)	2164	6.81	0.467 (0.284)	14.81 (2.92)	187 (86)	57 (14)	29.00 (98.21)
5th Gear									
145.44 (108.45)	16667 (74.14)	3.27 (5.27)	2125	5.13	0.461 (0.280)	15.00 (2.95)	186 (85)	60 (16)	28.99 (98.17)
6th Gear									
151.62 (113.06)	15727 (69.96)	3.62 (5.82)	2051	4.26	0.437 (0.266)	15.82 (3.12)	187 (86)	62 (17)	28.95 (98.04)
7th Gear									
149.61 (111.56)	13376 (59.50)	4.19 (6.75)	2051	3.65	0.443 (0.269)	15.62 (3.08)	187 (86)	63 (17)	28.93 (97.97)
8th Gear									
145.51 (108.50)	11246 (50.02)	4.85 (7.81)	2050	2.94	0.454 (0.276)	15.22 (3.00)	186 (86)	62 (17)	28.97 (98.10)
9th Gear									
146.62 (109.33)	9776 (43.49)	5.62 (9.05)	2053	2.49	0.454 (0.276)	15.24 (3.00)	187 (86)	61 (16)	28.98 (98.14)
10th Gear									
146.96 (109.59)	8607 (38.29)	6.40 (10.30)	2053	2.22	0.451 (0.274)	15.33 (3.02)	186 (86)	63 (17)	28.91 (97.90)
11th Gear									
145.44 (108.45)	7379 (32.82)	7.39 (11.90)	2051	1.94	0.459 (0.279)	15.06 (2.97)	187 (86)	65 (18)	28.88 (97.80)
12th Gear									
150.69 (112.37)	6817 (30.32)	8.29 (13.34)	2053	1.76	0.439 (0.267)	15.76 (3.10)	186 (86)	65 (18)	28.87 (97.77)
13th Gear									
145.63 (108.59)	5305 (23.60)	10.30 (16.57)	2054	1.39	0.455 (0.277)	15.18 (2.99)	189 (87)	65 (18)	28.87 (97.77)

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 return was maintained at 125° F (52° 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. This tractor did not meet manufacturers 3 point lift capacity claim of 8870 lb (4023 kg) or 9710 lb (4404 kg) with lift assist cylinder. The pull in 3rd gear (ballasted tractor) 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.

Report reissued. Supplemental sales permit for John Deere 4760 Powershift Diesel, November, 1991.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1621**, Summary 059, December 22, 1989.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 2200 RPM

MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

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 Gear									
128.71 (95.98)	21192 (94.27)	2.28 (3.67)	2261	10.23	0.499 (0.303)	13.85 (2.73)	186 (85)	55 (13)	29.01 (98.24)
4th Gear									
144.03 (107.40)	18563 (82.57)	2.91 (4.68)	2202	6.23	0.467 (0.284)	14.79 (2.91)	186 (85)	55 (13)	29.00 (98.21)
5th Gear									
143.97 (107.36)	15867 (70.58)	3.40 (5.48)	2200	4.70	0.468 (0.285)	14.77 (2.91)	186 (86)	58 (14)	28.99 (98.17)
6th Gear									
149.72 (111.65)	14393 (64.02)	3.90 (6.28)	2202	3.91	0.448 (0.273)	15.41 (3.04)	186 (86)	62 (17)	28.96 (98.07)
7th Gear									
147.48 (109.98)	12265 (54.56)	4.51 (7.26)	2196	3.39	0.454 (0.276)	15.24 (3.00)	186 (85)	62 (17)	28.94 (98.00)
8th Gear									
143.79 (107.23)	10330 (45.95)	5.22 (8.40)	2199	2.58	0.466 (0.283)	14.84 (2.92)	186 (85)	62 (17)	28.97 (98.10)
9th Gear									
143.75 (107.19)	8917 (39.66)	6.05 (9.73)	2203	2.31	0.469 (0.285)	14.75 (2.91)	186 (86)	60 (16)	28.98 (98.14)
10th Gear									
143.85 (107.27)	7861 (34.97)	6.86 (11.04)	2196	1.94	0.466 (0.283)	14.83 (2.92)	186 (85)	63 (17)	28.91 (97.90)
11th Gear									
141.98 (105.87)	6700 (29.80)	7.95 (12.79)	2201	1.76	0.470 (0.286)	14.71 (2.90)	185 (85)	65 (18)	28.89 (97.83)
12th Gear									
145.55 (108.54)	6136 (27.29)	8.90 (14.32)	2199	1.58	0.461 (0.281)	14.98 (2.95)	186 (85)	65 (18)	28.89 (97.83)

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear closest to 4.7 mph (7.5 km/h)—7th Gear	76.5
Maximum sound level	77.0
Transport speed—no load—15th Gear	77.0
Bystander in 15th Gear	85.5

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2196	1978	1762	1537	1321	1097
Pull—lbs (kN)	7861 (34.97)	8972 (39.91)	10056 (44.73)	10775 (47.93)	10785 (47.97)	9948 (44.25)
Increase in Pull %	0	14	28	37	37	27
Power—Hp (kW)	143.85 (107.27)	147.48 (109.97)	146.73 (109.42)	136.79 (102.00)	117.81 (87.85)	90.38 (67.39)
Speed—Mph (km/h)	6.86 (11.04)	6.16 (9.92)	5.47 (8.81)	4.76 (7.66)	4.10 (6.59)	3.41 (5.48)
Slip %	1.94	2.22	2.58	2.76	2.76	2.58

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. (bar)	2530 (174)				
Location	remote outlet				
Hydraulic oil temperature °F(°C)	137 (58)				
Location	transmission sump				
Category	III				
Quick attach	Yes				
Hitch point distance					
to ground level in. (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb.	8700	9228	9432	8944	8283
" " " " " " (kN)	(38.7)	(41.0)	(42.0)	(39.8)	(36.8)
with 1-44 mm. lift assist cylinder					
Hitch point distance					
to ground level in. (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb.	9860	10570	10854	10224	9411
" " " " " " (kN)	(43.9)	(47.0)	(48.3)	(45.5)	(41.9)
with 1-55 mm. lift assist cylinder					
Hitch point distance					
to ground level in. (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb.	10518	11434	11576	10737	10041
" " " " " " (kN)	(46.8)	(50.9)	(51.5)	(47.8)	(44.7)

TIRES AND WEIGHT		With Ballast	Without Ballast
Rear Tires —No., size, ply & psi (kPa)		Four 20.8R42; **, 12 (85)	Two 20.8R42; **, 16 (110)
Ballast —Duals (total)		1950 lb (885 kg)	None
—Cast Iron (total)		1000 lb (454 kg)	None
Front Tires —No., size, ply & psi (kPa)		Two 16.9R30; ***, 24 (165)	Two 16.9R30; ***, 24 (165)
Ballast —Test Equip (total)		230 lb (104 kg)	None
—Cast Iron (total)		1500 lb (680 kg)	None
Height of Drawbar		20.5 in (520 mm)	19 in (485 mm)
Static Weight —Rear		14245 lb (6461 kg)	11590 lb (5257 kg)
—Front		8600 lb (3901 kg)	6575 lb (2982 kg)
—Total		22845 lb (10362 kg)	18165 lb (8239 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III

Quick Attach: Yes

Maximum Force Exerted Through Whole Range:

5821 lbs (25.9 kN)
 *6614 lbs (29.4 kN)
 **7057 lbs (31.4 kN)

i) Opening pressure of relief valve:

NA
 2530 psi (174 Bar)

Sustained pressure with pump stalled

ii) Pump delivery rate at minimum pressure:

31.6 GPM (119.6 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

30.6 GPM (115.8 l/min)

Delivery pressure:

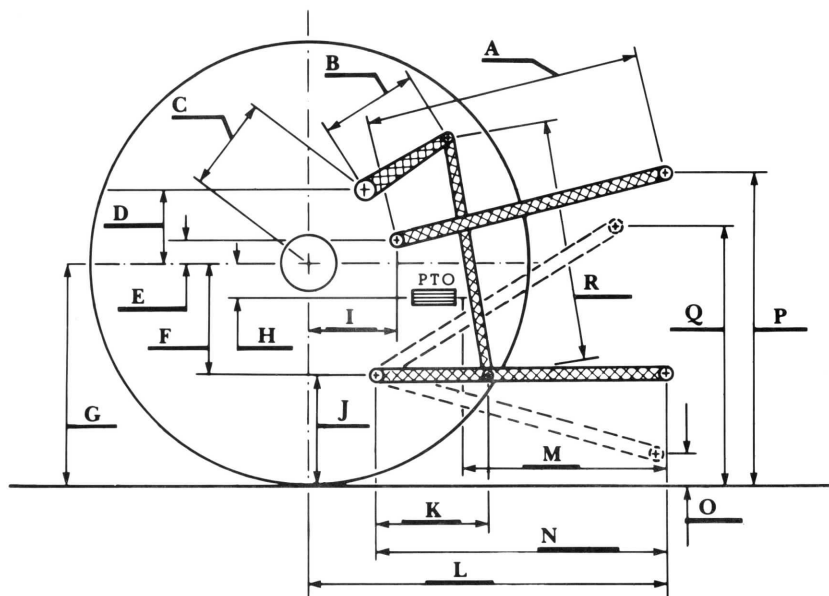
1750 psi (121 Bar)

Power:

31.2 Hp (23.3 kW)

*with 44 mm lift assist cylinder

**with 55 mm lift assist cylinder



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.1	714
B	18.4	468
C	12.9	327
D	12.9	327
E	6.8	172
F	13.0	330
G	36.1	918
H	7.0	177
I	15.1	384
J	23.1	588
K	28.2	716
L	44.3	1124
L'	49.3	1251
M	22.3	565
N	38.1	968
O	10.1	257
P	45.1	1146
Q	42.5	1080
R	37.3	946

L' to end of Quick attach



John Deere 4755 Powershift Diesel

Agricultural Research Division
 Institute of Agriculture and Natural Resources
 University of Nebraska—Lincoln
 Darrell Nelson, Dean and Director