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Test 1620: John Deere 4555 and 4560 Powershift Diesel 15-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1620—SUMMARY 058

JOHN DEERE 4555 POWERSHIFT DIESEL

ALSO JOHN DEERE 4560 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)					
156.89 (116.99)	2200	8.94 (33.83)	0.394 (0.240)	17.55 (3.46)	

Maximum Power (2 Hours)

162.47 (121.15)	1900	8.72 (32.99)	0.371 (0.226)	18.64 (3.67)	
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VARYING POWER AND FUEL CONSUMPTION

156.89 (116.99)	2200	8.94 (33.83)	0.394 (0.240)	17.55 (3.46)	Air temperature 77°F (25°C)
135.63 (101.14)	2242	7.99 (30.23)	0.407 (0.248)	16.98 (3.35)	
103.69 (77.32)	2276	6.60 (24.97)	0.440 (0.268)	15.72 (3.10)	Relative humidity 33%
70.56 (52.61)	2325	5.25 (19.88)	0.514 (0.313)	13.43 (2.65)	
35.55 (26.51)	2358	3.82 (14.46)	0.743 (0.452)	9.31 (1.83)	Barometer 29.10" Hg (98.54 kPa)
0.77 (0.58)	2389	2.43 (9.20)	21.706 (13.203)	0.32 (0.06)	

Maximum Torque 496 lb.-ft (672 Nm) at 1600 rpm

Maximum Torque Rise 32.6%

Torque Rise at 1000 engine rpm 23%

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									
131.40 (97.99)	5811 (25.85)	8.48 (13.65)	2199	2.26	0.470 (0.286)	14.70 (2.90)	184 (84)	72 (22)	28.82 (97.60)
75% of Pull at Maximum Power—12th Gear									
101.78 (75.90)	4357 (19.38)	8.76 (14.10)	2257	1.64	0.504 (0.307)	13.70 (2.70)	184 (84)	76 (24)	28.81 (97.56)
50% of Pull at Maximum Power—12th Gear									
69.64 (51.93)	2906 (12.93)	8.99 (14.46)	2301	1.02	0.600 (0.365)	11.53 (2.27)	180 (82)	76 (24)	28.81 (97.56)
75% of Pull at Reduced Engine Speed—13th Gear									
101.57 (75.74)	4354 (19.37)	8.75 (14.08)	1822	1.64	0.468 (0.285)	14.76 (2.91)	183 (84)	76 (24)	28.81 (97.56)
50% of Pull at Reduced Engine Speed—13th Gear									
69.85 (52.08)	2916 (12.97)	8.98 (14.46)	1858	1.02	0.530 (0.322)	13.05 (2.57)	181 (83)	76 (24)	28.81 (97.56)

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 5.433 gal (20.564 l) Drained from motor 5.233 gal (19.809 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 29.5 hours.

ENGINE: Make John Deere Diesel Type six cylinder vertical with turbocharger Serial No. *RG6076T102916* 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 cartridge and prefilter Muffler vertical Cooling medium temperature control 2 thermostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 59.9-65.4 lb/hr (27.2-29.7 kg/hr) High idle 2350-2400 rpm Turbo boost nominal 15-18 psi (103-124 kPa) as measured 16.5 psi (114 kPa).

CHASSIS: Type front wheel assist Serial No. *RW4555P001019* Tread width rear 62.0" (1574 mm) to 115.7" (2938 mm) front 63.1" (1603 mm) to 85.3" (2166 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 1.38 (2.22) second 1.97 (3.18) third 2.38 (3.84) fourth 3.00 (4.82) fifth 3.45 (5.55) sixth 3.92 (6.30) seventh 4.51 (7.26) eighth 5.18 (8.34) ninth 5.97 (9.61) tenth 6.78 (10.91) eleventh 7.81 (12.57) twelfth 8.74 (14.06) thirteenth 10.81 (17.40) fourteenth 15.12 (24.34) fifteenth 18.71 (30.11) reverse 1.91 (3.07), 2.73 (4.40), 4.15 (6.67), 6.25 (10.06) 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 17755 lb (8053 kg).

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)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
5th Gear									
120.34 (89.74)	15595 (69.37)	2.89 (4.66)	2160	13.92	0.513 (0.312)	13.48 (2.65)	183 (84)	58 (14)	28.63 (96.95)
6th Gear									
128.09 (95.52)	14051 (62.50)	3.42 (5.50)	2140	9.59	0.482 (0.293)	14.34 (2.83)	183 (84)	60 (16)	28.63 (96.95)
7th Gear									
132.62 (98.89)	12792 (56.90)	3.89 (6.26)	2049	6.82	0.464 (0.282)	14.88 (2.93)	183 (84)	58 (14)	28.83 (97.63)
8th Gear									
130.94 (97.64)	11786 (52.43)	4.17 (6.70)	1900	6.11	0.462 (0.281)	14.96 (2.95)	184 (84)	64 (18)	28.64 (96.99)
9th Gear									
134.03 (99.94)	10273 (45.69)	4.89 (7.87)	1901	4.72	0.451 (0.274)	15.32 (3.02)	185 (85)	59 (15)	28.83 (97.63)
10th Gear									
134.04 (99.96)	9008 (40.07)	5.58 (8.98)	1902	4.05	0.451 (0.274)	15.34 (3.02)	186 (85)	66 (19)	28.64 (96.99)
11th Gear									
133.06 (99.22)	7687 (34.19)	6.49 (10.45)	1902	3.12	0.453 (0.276)	15.25 (3.00)	186 (86)	67 (19)	28.82 (97.60)
12th Gear									
138.45 (103.24)	7124 (31.69)	7.29 (11.73)	1902	2.86	0.434 (0.264)	15.94 (3.14)	186 (85)	70 (21)	28.82 (97.60)
13th Gear									
135.47 (101.02)	5592 (24.87)	9.08 (14.62)	1903	2.26	0.446 (0.271)	15.49 (3.05)	186 (86)	71 (22)	28.82 (97.60)

DRAWBAR PERFORMANCE AT 1900 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)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
3rd Gear									
113.78 (84.84)	20873 (92.85)	2.04 (3.29)	2233	14.85	0.525 (0.319)	13.18 (2.60)	184 (84)	50 (10)	29.01 (98.24)
4th Gear									
131.44 (98.02)	18729 (83.31)	2.63 (4.24)	2126	8.38	0.472 (0.287)	14.66 (2.89)	184 (84)	50 (10)	29.07 (98.44)
5th Gear									
132.37 (98.71)	17978 (79.97)	2.76 (4.44)	1926	7.85	0.461 (0.281)	14.98 (2.95)	184 (84)	53 (12)	29.06 (98.41)
6th Gear									
137.51 (102.54)	16401 (72.95)	3.14 (5.06)	1899	6.19	0.443 (0.270)	15.60 (3.07)	185 (85)	54 (12)	29.06 (98.41)
7th Gear									
140.10 (104.48)	14269 (63.47)	3.68 (5.93)	1901	4.81	0.436 (0.265)	15.86 (3.13)	185 (85)	53 (12)	29.07 (98.44)
8th Gear									
134.95 (100.63)	11840 (52.66)	4.27 (6.88)	1903	3.81	0.453 (0.276)	15.25 (3.00)	185 (85)	56 (13)	29.00 (98.21)
9th Gear									
134.13 (100.02)	10152 (45.16)	4.95 (7.97)	1903	3.22	0.454 (0.276)	15.21 (3.00)	186 (85)	56 (13)	28.99 (98.17)
10th Gear									
135.54 (101.07)	9019 (40.12)	5.64 (9.07)	1901	2.88	0.448 (0.272)	15.43 (3.04)	185 (85)	54 (12)	29.06 (98.41)
11th Gear									
134.55 (100.34)	7737 (34.42)	6.52 (10.50)	1902	2.44	0.448 (0.272)	15.43 (3.04)	185 (85)	57 (14)	28.99 (98.17)
12th Gear									
139.28 (103.86)	7143 (31.77)	7.31 (11.77)	1902	2.36	0.435 (0.265)	15.88 (3.13)	185 (85)	58 (14)	28.98 (98.14)
13th Gear									
135.19 (100.81)	5587 (24.85)	9.07 (14.60)	1899	2.01	0.447 (0.272)	15.48 (3.05)	185 (85)	58 (14)	28.98 (98.14)

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 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 4560 Powershift Diesel, November, 1991.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1620, Summary 058, 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)	Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
114.57 (85.43)	20923 (93.07)	2.05 (3.30)	2233	14.38	0.522 (0.318)	13.23 (2.61)	183 (84)	50 (10)	28.99 (98.17)
4th Gear									
130.73 (97.49)	17759 (79.00)	2.76 (4.44)	2200	6.99	0.474 (0.288)	14.59 (2.87)	183 (84)	50 (10)	29.05 (98.37)
5th Gear									
132.35 (98.70)	15315 (68.12)	3.24 (5.22)	2201	5.30	0.467 (0.284)	14.81 (2.92)	184 (84)	53 (12)	29.07 (98.44)
6th Gear									
134.32 (100.16)	13576 (60.39)	3.71 (5.97)	2201	4.56	0.458 (0.279)	15.09 (2.97)	184 (84)	53 (12)	29.06 (98.41)
7th Gear									
135.08 (100.73)	11755 (52.29)	4.31 (6.94)	2201	3.64	0.460 (0.280)	15.03 (2.96)	183 (84)	52 (11)	29.07 (98.44)
8th Gear									
129.25 (96.38)	9745 (43.35)	4.97 (8.00)	2198	3.22	0.482 (0.293)	14.35 (2.83)	184 (84)	56 (13)	29.00 (98.21)
9th Gear									
128.43 (95.77)	8362 (37.20)	5.76 (9.27)	2199	2.70	0.481 (0.292)	14.38 (2.83)	183 (84)	56 (13)	29.00 (98.21)
10th Gear									
129.73 (96.74)	7430 (33.05)	6.55 (10.54)	2198	2.44	0.474 (0.289)	14.57 (2.87)	184 (84)	55 (13)	29.04 (98.34)
11th Gear									
128.27 (95.65)	6352 (28.25)	7.57 (12.19)	2199	2.10	0.483 (0.294)	14.30 (2.82)	183 (84)	57 (14)	28.99 (98.17)
12th Gear									
131.46 (98.03)	5805 (25.82)	8.49 (13.67)	2201	2.01	0.467 (0.284)	14.79 (2.91)	184 (84)	57 (14)	28.98 (98.14)

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	77.5
Bystander in 15th Gear	88.0

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2198	1981	1763	1539	1321	1094
Pull—lbs (kN)	7430 (33.05)	8602 (38.26)	9696 (43.13)	10143 (45.12)	10012 (44.54)	9573 (42.58)
Increase in Pull %	0	16	30	37	35	29
Power—Hp (kW)	129.73 (96.74)	134.94 (100.62)	134.91 (100.60)	122.96 (91.69)	104.09 (77.62)	82.61 (61.60)
Speed—Mph (km/h)	6.55 (10.54)	5.88 (9.47)	5.22 (8.40)	4.55 (7.32)	3.90 (6.27)	3.24 (5.21)
Slip %	2.44	2.62	2.96	3.30	3.30	2.96

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. (bar)	2550 (176)				
Location	remote outlet				
Hydraulic oil temperature °F(°C)	130 (54)				
Location	hydraulic 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. " " " " " " (kN)	8700 (38.7)	9228 (41.0)	9432 (42.0)	8944 (39.8)	8283 (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. " " " " " " (kN)	9860 (43.9)	10570 (47.0)	10854 (48.3)	10224 (45.5)	9411 (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. " " " " " " (kN)	10518 (46.8)	11434 (50.9)	11576 (51.5)	10737 (47.8)	10041 (44.7)

TIRES AND WEIGHT

	With Ballast	Without Ballast
Rear Tires —No., size, ply & psi (kPa)	Four 18.4R42; **, 12 (85)	Two 18.4R42; **, 18 (125)
Ballast —Duals (total)	1710 lb (776 kg)	None
—Cast Iron (total)	1000 lb (454 kg)	None
Front Tires —No., size, ply & psi (kPa)	Two 14.9R30; ***, 30 (205)	Two 14.9R30; ***, 30 (205)
Ballast —Test Equip (total)	190 lb (86 kg)	None
—Cast Iron (total)	1100 lb (499 kg)	None
Height of Drawbar	18.5 in (470 mm)	18.5 in (470 mm)
Static Weight —Rear	13840 lb (6278 kg)	11365 lb (5155 kg)
—Front	7915 lb (3590 kg)	6390 lb (2898 kg)
—Total	21755 lb (9868 kg)	17755 lb (8053 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:

Sustained pressure with pump stalled:

2550 psi	(176 Bar)
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ii) Pump delivery rate at minimum pressure and rated engine speed:

32.8 GPM	(124.2 l/min)
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iii) Pump delivery rate at maximum hydraulic power:

31.7 GPM	(120.0 l/min)
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Delivery pressure:

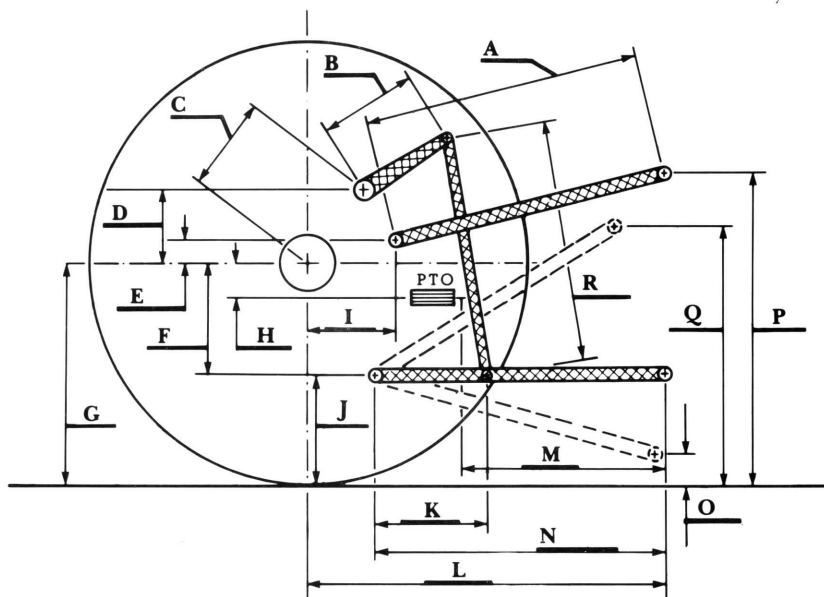
1750 psi	(121 Bar)
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Power:

32.4 Hp	(24.1 kW)
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*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	35.1	892
H	7.0	177
I	15.1	384
J	22.1	562
K	28.2	716
L	44.3	1124
L'	49.3	1251
M	22.3	565
N	38.1	968
O	9.1	231
P	44.1	1121
Q	41.5	1053
R	37.3	946

L' to end of Quick attach



John Deere 4555 Powershift Diesel

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