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Test 1617: John Deere 4055 Powershift Diesel 15-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1617—SUMMARY 055

JOHN DEERE 4055 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
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1002 rpm)					
109.18 (81.41)	2200	6.65 (25.16)	0.421 (0.256)	16.43 (3.24)	
Maximum Power (2 Hours)					
112.27 (83.72)	1950	6.43 (24.34)	0.396 (0.241)	17.46 (3.44)	

VARYING POWER AND FUEL CONSUMPTION

109.18 (81.41)	2200	6.65 (25.16)	0.421 (0.256)	16.43 (3.24)	Air temperature 76°F (24°C)
97.25 (72.52)	2301	6.38 (24.15)	0.453 (0.276)	15.24 (3.00)	
73.50 (54.81)	2328	5.43 (20.54)	0.510 (0.310)	13.55 (2.67)	Relative humidity 37%
49.31 (36.77)	2347	4.47 (16.92)	0.627 (0.381)	11.03 (2.17)	
24.86 (18.54)	2365	3.43 (12.98)	0.953 (0.580)	7.25 (1.43)	Barometer 29.02" Hg (98.26 kPa)
0.38 (0.28)	2383	2.47 (9.36)	45.315 (27.564)	0.15 (0.03)	

Maximum Torque 347 lb.-ft (471 Nm) at 1200 rpm

Maximum Torque Rise 33.3%

Torque Rise at 1000 engine rpm 31%

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—7th Gear									
92.79 (69.19)	7848 (34.91)	4.43 (7.14)	2201	3.32	0.493 (0.300)	14.02 (2.76)	185 (85)	70 (21)	28.93 (97.97)
75% of Pull at Maximum Power—7th Gear									
74.12 (55.27)	5889 (26.19)	4.72 (7.60)	2321	2.26	0.554 (0.337)	12.47 (2.46)	182 (83)	70 (21)	28.92 (97.93)
50% of Pull at Maximum Power—7th Gear									
50.14 (37.39)	3923 (17.45)	4.79 (7.71)	2339	1.60	0.666 (0.405)	10.37 (2.04)	180 (82)	70 (21)	28.92 (97.93)
75% of Pull at Reduced Engine Speed—9th Gear									
74.14 (55.28)	5886 (26.18)	4.72 (7.60)	1799	2.34	0.491 (0.299)	14.08 (2.77)	182 (83)	70 (21)	28.90 (97.87)
50% of Pull at Reduced Engine Speed—9th Gear									
50.20 (37.43)	3929 (17.48)	4.79 (7.71)	1811	1.60	0.560 (0.341)	12.35 (2.43)	179 (82)	70 (21)	28.90 (97.87)

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 3.555 gal (13.456 l) Drained from motor 3.478 gal (13.165 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 23.0 hours.

ENGINE: Make John Deere Diesel Type six cylinder vertical with turbocharger Serial No. *RG6076T102415* 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 44.1-48.2 lb/hr (20.0-21.8 kg/hr) High idle 2350-2400 rpm Turbo boost nominal 10-13 psi (69-90 kPa) as measured 10.0 psi (69 kPa).

CHASSIS: Type front wheel assist Serial No. *RW4055P001009* Tread width rear 62.0" (1574 mm) to 110.2" (2800 mm) front 60.6" (1538 mm) to 88.0" (2235 mm) Wheel base 105.3" (2675 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 1.41 (2.27) second 2.02 (3.25) third 2.38 (3.83) fourth 3.06 (4.93) fifth 3.53 (5.68) sixth 4.01 (6.45) seventh 4.61 (7.43) eighth 5.17 (8.32) ninth 5.96 (9.58) tenth 6.76 (10.88) eleventh 7.79 (12.53) twelfth 8.94 (14.38) thirteenth 11.06 (17.80) fourteenth 15.08 (24.27) fifteenth 18.65 (30.02) reverse 1.72 (2.76), 2.46 (3.96), 3.73 (6.01), 5.62 (9.05) 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 540 rpm at 2201 engine rpm and 1002 rpm at 2200 engine rpm Unladen tractor mass 13955 lb (6330 kg).

DRAWBAR PERFORMANCE AT 1950 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)	Temp. cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
78.06 (58.21)	13881 (61.75)	2.11 (3.39)	2283	13.90	0.585 (0.356)	11.82 (2.33)	179 (81)	54 (12)	29.03 (98.31)
4th Gear									
90.97 (67.83)	12361 (54.98)	2.76 (4.44)	2141	6.87	0.503 (0.306)	13.74 (2.71)	179 (82)	45 (7)	29.04 (98.34)
5th Gear									
93.93 (70.04)	12185 (54.20)	2.89 (4.65)	1948	6.80	0.478 (0.291)	14.45 (2.85)	183 (84)	61 (16)	29.02 (98.27)
6th Gear									
95.52 (71.23)	10712 (47.65)	3.34 (5.38)	1952	5.21	0.470 (0.286)	14.69 (2.89)	184 (84)	63 (17)	29.01 (98.24)
7th Gear									
96.51 (71.97)	9283 (41.29)	3.90 (6.27)	1952	4.03	0.466 (0.284)	14.82 (2.92)	186 (85)	70 (21)	28.92 (97.93)
8th Gear									
94.24 (70.27)	8039 (35.76)	4.40 (7.08)	1950	3.48	0.475 (0.289)	14.55 (2.87)	185 (85)	70 (21)	28.93 (97.97)
9th Gear									
94.37 (70.37)	6954 (30.93)	5.09 (8.19)	1948	2.83	0.474 (0.288)	14.59 (2.87)	185 (85)	70 (21)	28.94 (98.00)
10th Gear									
93.33 (69.59)	6023 (26.79)	5.81 (9.35)	1953	2.42	0.482 (0.293)	14.34 (2.83)	184 (84)	65 (18)	28.99 (98.17)
11th Gear									
93.54 (69.75)	5227 (23.25)	6.71 (10.80)	1950	2.10	0.481 (0.293)	14.37 (2.83)	184 (84)	68 (20)	28.97 (98.10)
12th Gear									
95.30 (71.07)	4631 (20.60)	7.72 (12.42)	1947	1.77	0.467 (0.284)	14.79 (2.91)	185 (85)	70 (21)	28.96 (98.07)
13th Gear									
92.69 (69.12)	3622 (16.11)	9.60 (15.44)	1951	1.43	0.483 (0.294)	14.32 (2.82)	184 (84)	70 (21)	28.95 (98.04)

DRAWBAR PERFORMANCE AT 2200 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)	Temp. cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
78.09 (58.23)	13950 (62.05)	2.10 (3.38)	2286	14.34	0.585 (0.356)	11.81 (2.33)	179 (81)	51 (11)	29.03 (98.31)
4th Gear									
89.82 (66.98)	11764 (52.33)	2.86 (4.61)	2201	5.74	0.510 (0.310)	13.55 (2.67)	180 (82)	48 (9)	29.04 (98.34)
5th Gear									
91.33 (68.11)	10243 (45.56)	3.34 (5.38)	2202	4.58	0.504 (0.306)	13.72 (2.70)	182 (83)	60 (16)	29.02 (98.27)
6th Gear									
91.75 (68.42)	9023 (40.13)	3.81 (6.14)	2198	3.95	0.499 (0.304)	13.85 (2.73)	182 (83)	62 (17)	29.01 (98.24)
7th Gear									
92.79 (69.19)	7848 (34.91)	4.43 (7.14)	2201	3.32	0.493 (0.300)	14.02 (2.76)	185 (85)	70 (21)	28.93 (97.97)
8th Gear									
90.23 (67.29)	6783 (30.17)	4.99 (8.03)	2199	2.75	0.508 (0.309)	13.62 (2.68)	184 (84)	70 (21)	28.93 (97.97)
9th Gear									
89.69 (66.88)	5826 (25.91)	5.77 (9.29)	2199	2.34	0.508 (0.309)	13.59 (2.68)	184 (84)	70 (21)	28.94 (98.00)
10th Gear									
89.28 (66.58)	5087 (22.63)	6.58 (10.59)	2202	2.01	0.510 (0.310)	13.54 (2.67)	182 (83)	70 (21)	28.95 (98.04)
11th Gear									
87.33 (65.12)	4310 (19.17)	7.60 (12.23)	2200	1.68	0.522 (0.317)	13.24 (2.61)	183 (84)	66 (19)	28.98 (98.14)
12th Gear									
89.98 (67.10)	3862 (17.18)	8.74 (14.06)	2201	1.52	0.511 (0.311)	13.53 (2.67)	183 (84)	69 (21)	28.96 (98.07)

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 122° F (50° 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 6550 lb (2971 kg) or 8470 lb (3842 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.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1617**, Summary 055, December 22, 1989.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

R. D. GRISSO

G. J. HOFFMAN

Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB					dB(A)
Gear closest to 4.7 mph (7.5 km/h)—7th Gear					74.5
Maximum sound level					75.5
Transport speed—no load—15th Gear					77.0
Bystander in 15th Gear					87.0

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2202	1979	1757	1541	1320	1101
Pull—lbs (kN)	5087 (22.63)	5961 (26.52)	6457 (28.72)	6892 (30.66)	7041 (31.32)	7029 (31.27)
Increase in Pull %	0	17	27	35	38	38
Power—Hp (kW)	89.28 (66.58)	93.63 (69.82)	89.85 (67.00)	83.96 (62.61)	73.36 (54.71)	61.12 (45.58)
Speed—Mph (km/h)	6.58 (10.59)	5.89 (9.48)	5.22 (8.40)	4.57 (7.35)	3.91 (6.29)	3.26 (5.25)
Slip %	2.01	2.34	2.51	2.83	2.99	2.83

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. (bar)	2560 (176)				
Location	remote outlet				
Hydraulic oil temperature °F(°C)	142 (61)				
Location	transmission sump				
Category	II				
Quick attach	No				

Hitch point distance to ground level in. (mm)	8.7 (221)	15.7 (399)	22.4 (569)	30.4 (772)	37.4 (950)
Lift force on frame lb. " " " " " " (kN)	7550 (33.6)	7482 (33.3)	7199 (32.0)	6526 (29.0)	6175 (27.5)

with lift assist cylinder

Hitch point distance to ground level in. (mm)	9.0 (229)	16.0 (406)	22.3 (566)	30.4 (772)	37.4 (950)
Lift force on frame lb. " " " " " " (kN)	9833 (43.7)	9872 (43.9)	9540 (42.4)	8633 (38.4)	8077 (35.9)

TIRES AND WEIGHT

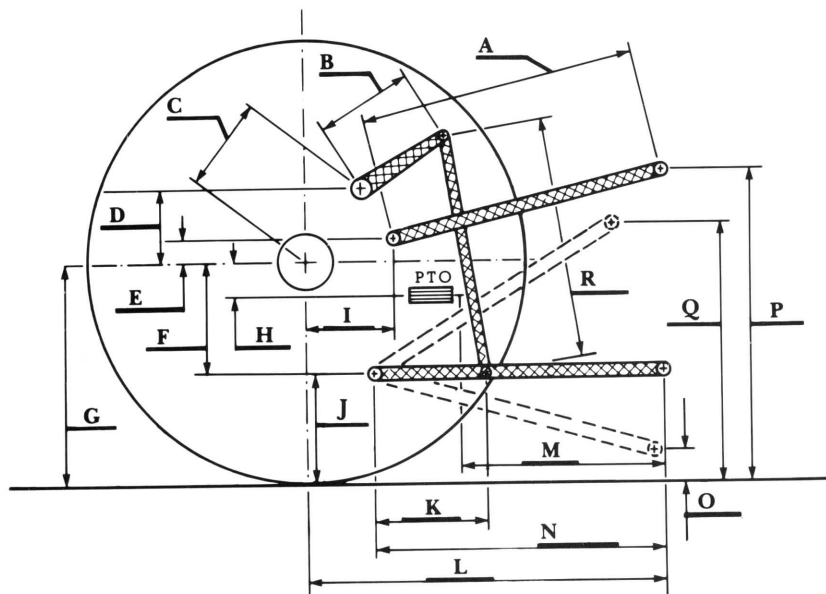
Rear Tires	—No., size, ply & psi (kPa)	Tested Without Ballast
		Two 18.4R38; *, 16 (110)
Front Tires	—No., size, ply & psi (kPa)	Two 14.9R26; ***, 30 (205)
Height of Drawbar		17.0 in (430 mm)
Static Weight	—Rear	8580 lb (3892 kg)
	—Front	5375 lb (2438 kg)
	—Total	13955 lb (6330 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: None

Maximum Force Exerted Through Whole Range:	5504 lbs (24.5 kN)
	*7281 lbs (32.4 kN)
i) Opening pressure of relief valve:	NA
Sustained pressure with pump stalled:	2560 psi (176 Bar)
ii) Pump delivery rate at minimum pressure:	27.0 GPM (102.2 l/min)
iii) Pump delivery rate at maximum hydraulic power:	26.1 GPM (98.8 l/min)
Delivery pressure:	2100 psi (145 Bar)
Power:	32.0 Hp (23.8 kW)
	*with lift assist cylinder



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	26.6	676
B	11.5	292
C	11.3	287
D	10.9	278
E	5.5	140
F	10.2	259
G	33.1	842
H	6.5	165
I	13.5	343
J	22.9	583
K	23.1	587
L	41.2	1046
M	21.6	549
N	36.7	932
O	8.3	211
P	43.0	1093
Q	35.5	903
R	32.8	833



John Deere 4055 Powershift Diesel