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Test 1628: John Deere 4455 Quadrange Diesel 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1628—SUMMARY 066

JOHN DEERE 4455 QUADRANGE 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—1002 rpm)					
142.69 (106.40)	2200	8.37 (31.67)	0.405 (0.246)	17.05 (3.36)	
Maximum Power (2 Hours)					
148.14 (110.47)	1900	8.16 (30.91)	0.381 (0.232)	18.14 (3.57)	

VARYING POWER AND FUEL CONSUMPTION

142.69 (106.40)	2200	8.37 (31.67)	0.405 (0.246)	17.05 (3.36)	Air temperature 74°F (23°C)
125.87 (93.86)	2281	7.77 (29.42)	0.427 (0.260)	16.20 (3.19)	
95.37 (71.12)	2309	6.38 (24.16)	0.462 (0.281)	14.94 (2.94)	Relative humidity 36%
64.20 (47.87)	2331	5.04 (19.06)	0.542 (0.330)	12.75 (2.51)	
32.40 (24.16)	2353	3.78 (14.30)	0.806 (0.490)	8.58 (1.69)	Barometer 29.08" Hg (98.46 kPa)
1.03 (0.77)	2374	2.43 (9.20)	16.310 (9.921)	0.42 (0.08)	

Maximum Torque 469 lb.-ft (636 Nm) at 1350 rpm

Maximum Torque Rise 37.5%

Torque Rise at 1000 engine rpm 30.7%

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 drv bulb	Barom. inch Hg (kPa)
Maximum Power—9th (B3) Gear									
128.59 (95.89)	6115 (27.20)	7.89 (12.69)	2201	2.81	0.447 (0.272)	15.46 (3.05)	187 (86)	71 (22)	28.87 (97.77)
75% of Pull at Maximum Power—9th (B3) Gear									
101.56 (75.73)	4589 (20.41)	8.30 (13.36)	2302	2.20	0.489 (0.298)	14.12 (2.78)	186 (86)	77 (25)	28.87 (97.77)
50% of Pull at Maximum Power—9th (B3) Gear									
69.08 (51.51)	3063 (13.62)	8.46 (13.61)	2331	1.51	0.566 (0.344)	12.21 (2.41)	183 (84)	77 (25)	28.87 (97.77)
75% of Pull at Reduced Engine Speed—12th (B4) Gear									
101.29 (75.53)	4583 (20.39)	8.29 (13.34)	1822	2.20	0.449 (0.273)	15.38 (3.03)	187 (86)	78 (26)	28.87 (97.77)
50% of Pull at Reduced Engine Speed—12th (B4) Gear									
68.83 (51.33)	3053 (13.58)	8.46 (13.61)	1848	1.51	0.499 (0.303)	13.85 (2.73)	181 (83)	78 (26)	28.87 (97.77)

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

Dates of Test: September-October, 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) 0.8300 Fuel weight 6.910 lbs/gal (0.828 kg/l) Oil SAE 15W40 API service classification CD/SD To motor 4.181 gal (15.827 l) Drained from motor 3.927 gal (14.865 l) Transmission and hydraulic lubricant John Deere HyGard fluid Total time engine was operated 23.0 hours.

ENGINE: Make John Deere Diesel Type six cylinder vertical with turbocharger Serial No. *RG6076T109286* 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 56.3-61.5 lb/hr (25.6-27.9 kg/hr) High idle 2350-2400 rpm Turbo boost nominal 14-17 psi (97-117 kPa) as measured 17.0 psi (117 kPa).

CHASSIS: Type standard Serial No. *RW4455H002608* Tread width rear 62.0" (1574 mm) to 116.0" (2950 mm) front 58.0" (1470 mm) to 82.0" (2080 mm) Wheel base 106.7" (2710 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 2.16 (3.47) second 2.73 (4.39) third 3.56 (5.74) fourth 4.50 (7.25) fifth 4.96 (7.99) sixth 5.88 (9.47) seventh 6.27 (10.10) eighth 7.43 (11.97) ninth 8.20 (13.20) tenth 9.03 (14.53) eleventh 9.71 (15.64) twelfth 10.36 (16.68) thirteenth 11.41 (18.37) fourteenth 12.28 (19.77) fifteenth 14.91 (24.01) sixteenth 18.84 (30.34) reverse 3.45 (5.56), 4.36 (7.03), 7.94 (12.78), 9.41 (15.15), 10.03 (16.15), 11.89 (19.15) 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 13315 lb (6040 kg).

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

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)	Temp.°F (°C)	Temp.°F (°C)	Temp.°F (°C)	Barom. inch Hg (kPa)
3rd (A3) Gear									
108.51 (80.91)	12195 (54.24)	3.34 (5.37)	2286	8.85	0.491 (0.299)	14.07 (2.77)	185 (85)	65 (18)	28.88 (97.80)
4th (A4) Gear									
124.19 (92.61)	11298 (50.26)	4.12 (6.63)	2182	6.60	0.465 (0.283)	14.87 (2.93)	186 (86)	65 (18)	28.90 (97.87)
5th (B1) Gear									
127.85 (95.34)	10958 (48.74)	4.38 (7.04)	2100	6.52	0.449 (0.273)	15.39 (3.03)	187 (86)	73 (23)	28.89 (97.83)
6th (C1) Gear									
132.40 (98.73)	10441 (46.44)	4.76 (7.65)	1905	5.48	0.430 (0.262)	16.07 (3.17)	189 (87)	72 (22)	28.88 (97.80)
7th (B2) Gear									
131.38 (97.97)	9634 (42.85)	5.11 (8.23)	1904	4.66	0.433 (0.264)	15.94 (3.14)	189 (87)	69 (21)	28.86 (97.73)
8th (C2) Gear									
130.97 (97.66)	8058 (35.84)	6.10 (9.81)	1903	4.00	0.433 (0.264)	15.95 (3.14)	190 (88)	73 (23)	28.88 (97.80)
9th (B3) Gear									
134.18 (100.06)	7430 (33.05)	6.77 (10.90)	1903	3.41	0.425 (0.258)	16.27 (3.20)	189 (87)	70 (21)	28.87 (97.77)
10th (D1) Gear									
132.85 (99.07)	6684 (29.73)	7.45 (12.00)	1900	3.24	0.426 (0.259)	16.22 (3.20)	189 (87)	74 (23)	28.88 (97.80)
11th (C3) Gear									
133.14 (99.28)	6229 (27.71)	8.02 (12.90)	1893	2.98	0.425 (0.259)	16.26 (3.20)	190 (88)	75 (24)	28.88 (97.80)

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)	Temp.°F (°C)	Temp.°F (°C)	Barom. inch Hg (kPa)
2nd (A2) Gear									
114.68 (85.51)	17159 (76.33)	2.51 (4.03)	2263	9.74	0.492 (0.299)	14.05 (2.77)	184 (84)	56 (13)	29.27 (99.12)
3rd (A3) Gear									
130.06 (96.99)	15839 (70.46)	3.08 (4.96)	2049	6.36	0.445 (0.271)	15.52 (3.06)	186 (86)	62 (17)	29.28 (99.15)
4th (A4) Gear									
131.29 (97.90)	13021 (57.92)	3.78 (6.09)	1951	4.41	0.438 (0.266)	15.78 (3.11)	188 (86)	62 (17)	29.27 (99.12)
5th (B1) Gear									
134.35 (100.18)	12394 (55.13)	4.07 (6.54)	1901	4.08	0.424 (0.258)	16.28 (3.21)	188 (86)	66 (19)	29.26 (99.09)
6th (C1) Gear									
135.77 (101.24)	10473 (46.58)	4.86 (7.82)	1905	3.40	0.420 (0.255)	16.47 (3.24)	189 (87)	67 (19)	29.26 (99.09)
7th (B2) Gear									
132.03 (98.45)	9542 (42.44)	5.19 (8.35)	1899	3.06	0.431 (0.262)	16.04 (3.16)	189 (87)	69 (21)	29.24 (99.02)
8th (C2) Gear									
132.74 (98.98)	8037 (35.75)	6.19 (9.97)	1902	2.46	0.429 (0.261)	16.09 (3.17)	189 (87)	69 (21)	29.23 (98.98)
9th (B3) Gear									
134.59 (100.36)	7380 (32.83)	6.84 (11.01)	1899	2.29	0.422 (0.257)	16.36 (3.22)	189 (87)	69 (21)	29.22 (98.95)
10th (D1) Gear									
134.86 (100.57)	6695 (29.78)	7.55 (12.16)	1902	2.12	0.423 (0.257)	16.34 (3.22)	189 (87)	70 (21)	29.21 (98.92)
11th (C3) Gear									
134.46 (100.27)	6202 (27.59)	8.13 (13.08)	1898	1.94	0.424 (0.258)	16.31 (3.21)	190 (88)	70 (21)	29.20 (98.88)

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 128° F (53° 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 pull in 3rd (A3) gear (unballasted tractor) was limited by tire tangential pull. The pull in 2nd (A2) gear (ballasted tractor) was limited by tractor stability. 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. **1628**, Summary 066, 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 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)
2nd (A2) Gear									
116.10 (86.57)	17161 (76.34)	2.54 (4.08)	2265	8.61	0.486 (0.296)	14.21 (2.80)	185 (85)	54 (12)	29.27 (99.12)
3rd (A3) Gear									
127.33 (94.95)	14235 (63.32)	3.35 (5.40)	2200	4.99	0.454 (0.276)	15.21 (3.00)	185 (85)	60 (16)	29.28 (99.15)
4th (A4) Gear									
126.20 (94.11)	11008 (48.97)	4.30 (6.92)	2200	3.66	0.457 (0.278)	15.13 (2.98)	186 (86)	62 (17)	29.28 (99.15)
5th (B1) Gear									
128.78 (96.03)	10157 (45.18)	4.75 (7.65)	2204	3.32	0.448 (0.272)	15.44 (3.04)	186 (85)	64 (18)	29.27 (99.12)
6th (C1) Gear									
128.84 (96.07)	8547 (38.02)	5.65 (9.10)	2197	2.72	0.446 (0.271)	15.49 (3.05)	187 (86)	67 (19)	29.25 (99.05)
7th (B2) Gear									
126.74 (94.51)	7853 (34.93)	6.05 (9.74)	2201	2.38	0.450 (0.274)	15.35 (3.02)	188 (86)	67 (19)	29.24 (99.02)
8th (C2) Gear									
125.90 (93.88)	6559 (29.18)	7.20 (11.58)	2198	2.03	0.456 (0.277)	15.17 (2.99)	188 (87)	69 (21)	29.23 (98.98)
9th (B3) Gear									
128.32 (95.68)	6060 (26.95)	7.94 (12.78)	2196	1.94	0.450 (0.273)	15.37 (3.03)	188 (87)	69 (21)	29.22 (98.95)
10th (D1) Gear									
127.62 (95.17)	5459 (24.28)	8.77 (14.11)	2198	1.68	0.451 (0.274)	15.34 (3.02)	189 (87)	69 (21)	29.21 (98.92)

TRACTOR SOUND LEVEL WITH CAB		dB(A)
Gear closest to 4.7 mph (7.5 km/h)—5th (B1) Gear		76.0
Maximum sound level		76.0
Transport speed—no load—16th (D4) Gear		76.0
Bystander in 16th (D4) Gear		85.0

LUGGING ABILITY IN 6th (C1) GEAR

Crankshaft Speed rpm	2197	1984	1765	1540	1323	1106
Pull—lbs (kN)	8547 (38.02)	9938 (44.21)	10969 (48.79)	11586 (51.54)	11924 (53.04)	11832 (52.63)
Increase in Pull %	0	16	28	36	40	38
Power—Hp (kW)	128.84 (96.07)	134.53 (100.32)	131.74 (98.24)	121.00 (90.23)	106.67 (79.54)	88.54 (66.02)
Speed—Mph (km/h)	5.65 (9.10)	5.08 (8.17)	4.50 (7.25)	3.92 (6.30)	3.35 (5.40)	2.81 (4.52)
Slip %	2.72	3.06	3.57	3.74	3.91	3.91

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. (<i>bar</i>)				2560 (<i>176</i>)		
Location				remote outlet		
Hydraulic oil temperature °F(°C)				143 (<i>62</i>)		
Location				transmission sump		
Category				II		
Quick attach				No		
Hitch point distance						
to ground level in. (<i>mm</i>)		8.7 (<i>221</i>)	15.7 (<i>399</i>)	22.4 (<i>569</i>)	30.4 (<i>772</i>)	37.4 (<i>950</i>)
Lift force on frame lb.		7550	7482	7199	6526	6175
" " " " " " (<i>kN</i>)		(<i>33.6</i>)	(<i>33.3</i>)	(<i>32.0</i>)	(<i>29.0</i>)	(<i>27.5</i>)
with lift assist cylinder						
Hitch point distance						
to ground level in. (<i>mm</i>)		9.0 (<i>229</i>)	16.0 (<i>406</i>)	22.3 (<i>566</i>)	30.4 (<i>772</i>)	37.4 (<i>950</i>)
Lift force on frame lb.		9833	9872	9540	8633	8077
" " " " " " (<i>kN</i>)		(<i>43.7</i>)	(<i>43.9</i>)	(<i>42.4</i>)	(<i>38.4</i>)	(<i>35.9</i>)

TIRES AND WEIGHT

Rear Tires —No., size, ply & psi (kPa)	With Ballast	Without Ballast
Ballast —Duals (total)	Four 18.4R42; **, 14 (95)	Two 18.4R42; **, 18 (125)
—Cast Iron (total)	1710 lb (776 kg)	None
	2000 lb (907 kg)	None
Front Tires —No., size, ply & psi (kPa)	Two 11.00-16; 8; 40 (275)	Two 11.00-16; 8; 40 (275)
Ballast —Liquid (total)	None	None
—Test Equip (total)	185 lb (84 kg)	None
Height of Drawbar	19 in (485 mm)	25 in (635 mm)
Static Weight —Rear	13390 lb (6073 kg)	9475 lb (4298 kg)
—Front	3820 lb (1733 kg)	3840 lb (1742 kg)
—Total	17210 lb (7806 kg)	13315 lb (6040 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:

27.1 GPM (102.6 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

26.1 GPM (98.8 l/min)

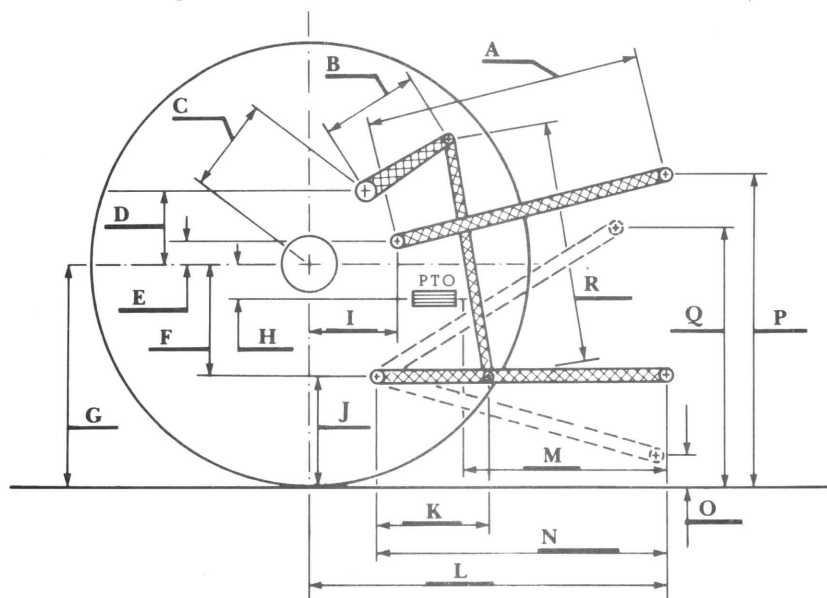
Delivery pressure:

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	5.6	143
F	10.2	259
G	35.1	892
H	6.5	165
I	14.3	362
J	24.9	633
K	23.1	587
L	41.6	1056
M	22.0	558
N	37.1	942
O	10.3	262
P	45.0	1143
Q	37.5	953
R	32.8	833



John Deere 4455 Quadrange Diesel

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