

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F.
Larsen

January 2007

Test 1905: John Deere 5603 Diesel 12-Speed

Tractor Museum

University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

Follow this and additional works at: <http://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Applied Mechanics Commons](#)

Museum, Tractor, "Test 1905: John Deere 5603 Diesel 12-Speed" (2007). *Nebraska Tractor Tests*. 2082.
<http://digitalcommons.unl.edu/tractormuseumlit/2082>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA TRACTOR TEST 1905

JOHN DEERE 5603 DIESEL

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—539 rpm)					
82.81 (61.75)	2404	5.62 (21.27)	0.475 (0.289)	14.74 (2.90)	
Maximum Power (1 hour)					
83.78 (62.47)	2198	5.43 (20.56)	0.454 (0.276)	15.43 (3.04)	

VARYING POWER AND FUEL CONSUMPTION

82.81 (61.75)	2404	5.62 (21.27)	0.475 (0.289)	14.74 (2.90)	Air temperature
73.49 (54.80)	2499	5.34 (20.22)	0.509 (0.310)	13.75 (2.71)	77°F (25°C)
55.77 (41.59)	2539	4.54 (17.20)	0.570 (0.347)	12.28 (2.42)	Relative humidity
37.43 (27.91)	2564	3.69 (13.95)	0.689 (0.419)	10.16 (2.00)	79%
19.00 (14.17)	2595	2.56 (9.68)	0.942 (0.573)	7.43 (1.46)	Barometer
0.61 (0.46)	2616	1.74 (6.60)	19.881 (12.093)	0.35 (0.07)	28.66"Hg (97.05 kPa)

Maximum torque 253 lb.-ft. (343 Nm) at 1407 rpm
 Maximum torque rise - 39.9%
 Torque rise at 1902 rpm - 25%
 Power increase at 2200 rpm - 1%

TRACTOR SOUND LEVEL WITH CAB

	Front Wheel Drive Engaged dB(A)	Disengaged dB(A)
At no load in 6th(B2) gear	82.4	82.5
Transport speed-no load-12th(C4) gear		81.5
Bystander in 12th(C4) gear		86.6

TIRES AND WEIGHT

Rear tires—No., size, ply & psi (kPa)
Front tires—No., size, ply & psi (kPa)
Height of drawbar
Static weight with operator—Rear
 —Front
 —Total

Tested without ballast

Two 18.4-30; 8; 12 (85)
 Two 12.4-24; 8; 14 (95)
 18.0 in (455 mm)
 4320 lb (1960 kg)
 3000 lb (1360 kg)
 7320 lb (3320 kg)

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln Nebraska 68583-0832

Dates of tests: September 6 - 11, 2007

Manufacturer: John Deere Commercial Products Inc., 700 Horizon South Parkway, Grovetown Ga. USA, 30813

FUEL, OIL and TIME: Fuel No. 2 Diesel Specific gravity converted to 60°/60° F (15°/15°C) 0.8407 Fuel weight 7.000 lbs/gal (0.839 kg/l) Oil SAE 15W40 API service classification CG-4 Transmission and hydraulic lubricant John Deere Hy-Gard fluid Front axle lubricant SAE 80W90 API GL-5 Total time engine was operated 9.5 hours

ENGINE: Make John Deere Diesel **Type** four cylinder vertical with turbocharger **Serial No.** *PE4045T669018* **Crankshaft** lengthwise **Rated engine speed** 2400 **Bore and stroke** 4.19" x 5.00" (106.4 mm x 127.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 276 cu in (4517 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element and one polyester felt element **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic fluid **Fuel filter** one paper element **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** one thermostat

ENGINE OPERATING PARAMETERS: Fuel rate: 36.6 - 40.6 lb/h (16.6 - 18.4 kg/h) **High idle:** 2600 - 2650 rpm **Turbo boost:** nominal 13.1 - 15.2 psi (90 - 105 kPa) as measured 14.1 psi (97 kPa)

CHASSIS: Type front wheel assist **Serial No.** *LV5603R167563* **Tread width** rear 55.8" (1417 mm) to 71.7" (1820 mm) front 52.8" (1340 mm) to 75.0" (1904 mm) **Wheelbase** 85.7" (2177 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.05 (1.69) second 1.42 (2.29) third 1.94 (3.13) fourth 2.60 (4.19) fifth 3.02 (4.86) sixth 4.11 (6.61) seventh 6.00 (9.66) eighth 8.05 (12.95) ninth 9.34 (15.03) tenth 12.71 (20.46) eleventh 17.36 (27.93) twelfth 23.25 (37.41) reverse 1.14 (1.84), 1.55 (2.50), 2.13 (3.42), 2.85 (4.58), 3.29 (5.30), 4.48 (7.21), 6.12 (9.85), 8.20 (13.19), 9.52 (15.32), 12.96 (20.85), 17.69 (28.47), 23.69 (38.13) **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc mechanically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2410 engine rpm or 540 rpm at 1710 engine rpm **Unladen tractor mass** 7145 lb (3240 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick attach: None

Maximum force exerted through whole range: 3213 lbs (14.3 kN)

i) Sustained pressure of the open relief valve: 2829 psi (195 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 16.4 GPM (62.1 l/min)

iii) Pump delivery rate at maximum hydraulic power: 16.7 GPM (63.2 l/min)
 Delivery pressure: 2359 psi (163 bar)
 Power: 23.0 HP (17.1 kW)

THREE POINT HITCH PERFORMANCE

Observed maximum pressure psi.(bar) 2830 (195)
 Location: remote outlet
 Hydraulic oil temperature: °F (°C) 148 (64)
 Location: pump inlet
 Category: II
 Quick attach: none

SAE Static Test—System pressure 2520 psi (174 Bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	15.0 (381)	22.0 (559)	29.0 (737)	36.0 (914)
Lift force on frame lb	4694	4829	4685	4266	3596
" " " " " " (kN)	(20.9)	(21.5)	(20.8)	(19.0)	(16.0)

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 137°F (58°C).

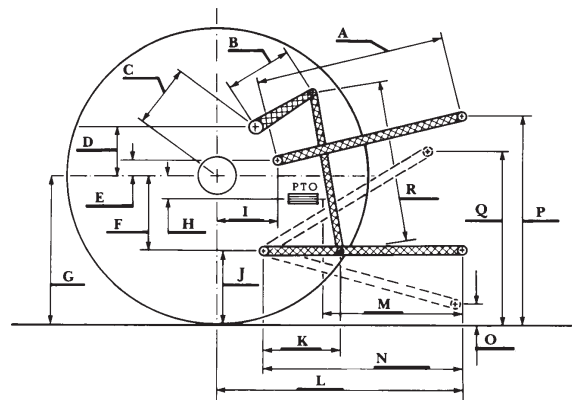
We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1905, November 27, 2007.

Roger M Hoy
 Director

M.F. Kocher
 V.I. Adamchuk
 J.A. Smith
 Board of Tractor Test Engineers

	SAE Test		OECD Test	
	inch	mm	inch	mm
A	23.2	590	24.1	613
B	11.0	280	11.0	280
C	14.0	356	14.0	356
D	12.2	311	12.2	311
E	11.2	284	11.2	284
F	6.5	165	6.5	165
G	27.4	695	27.4	695
H	0.2	4	0.2	4
I	15.1	384	15.1	384
J	20.9	530	20.9	530
K	16.7	424	16.7	424
L	39.2	996	39.2	996
M	22.4	570	22.4	570
N	32.9	836	32.9	836
O	8.0	203	8.0	203
P	40.9	1040	44.9	1140
Q	34.0	864	34.0	864
R	20.8	527	20.8	527

HITCH DIMENSIONS AS TESTED - NO LOAD



Shiftable PTO Performance

Economy mode

540 PTO rpm @ 1710 engine rpm

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)
64.90 (48.40)	1715	3.93 (14.87)	0.424 (0.258)	16.52 (3.25)
48.12 (35.88)	1710	3.07 (11.63)	0.447 (0.272)	15.67 (3.09)
31.92 (23.80)	1712	2.14 (8.11)	0.470 (0.286)	14.89 (2.93)
16.08 (11.99)	1707	1.39 (5.25)	0.603 (0.367)	11.60 (2.29)
0.49 (0.36)	1716	0.77 (2.92)	11.057 (6.726)	0.63 (0.12)

Normal mode

540 PTO rpm @ 2410 engine rpm

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)
64.67 (48.22)	2400	4.69 (17.74)	0.507 (0.309)	13.80 (2.72)
48.27 (36.00)	2411	3.93 (14.87)	0.570 (0.347)	12.29 (2.42)
32.20 (24.01)	2405	2.93 (11.09)	0.637 (0.387)	10.99 (2.17)
16.25 (12.12)	2418	2.13 (8.06)	0.917 (0.558)	7.64 (1.51)
0.57 (0.42)	2414	1.47 (5.57)	18.181 (11.059)	0.39 (0.08)



John Deere 5603 Diesel