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2009

Test 1948: John Deere 5093E Ltd. Diesel

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1948

JOHN DEERE 5093E LIMITED 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
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MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—(PTO speed—538 rpm)					
76.60 (57.12)	2400	4.93 (18.67)	0.454 (0.276)	15.53 (3.06)	
Maximum Power - (1 hour)					
80.94 (60.35)	2200	4.80 (18.19)	0.419 (0.255)	16.84 (3.32)	

VARYING POWER AND FUEL CONSUMPTION

76.60 (57.12)	2400	4.93 (18.67)	0.454 (0.276)	15.53 (3.06)	Air temperature
68.47 (51.06)	2522	4.80 (18.18)	0.495 (0.301)	14.26 (2.81)	79°F (26°C)
51.92 (38.72)	2550	4.12 (15.59)	0.560 (0.340)	12.60 (2.48)	Relative humidity
34.86 (26.00)	2568	3.35 (12.69)	0.678 (0.412)	10.40 (2.05)	13%
17.64 (13.15)	2599	2.30 (8.70)	0.919 (0.559)	7.68 (1.51)	Barometer
1.39 (1.03)	2623	1.62 (6.15)	8.262 (5.025)	0.85 (0.17)	28.68"Hg (97.12 kPa)

Maximum Torque 231 lb.-ft. (313 Nm) at 1597 rpm
Maximum Torque Rise - 37.7%
Torque rise at 1900 rpm - 25%
Power increase at 2200 rpm - 5%

TRACTOR SOUND LEVEL WITH CAB

	Front Wheel Drive Engaged dB(A)	Disengaged dB(A)
At no load in 6th (B2) gear	78.9	79.0
Transport in 12th (C4) gear		79.3
Bystander in 12th (C4) gear		84.5

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; 12 (85)
19.5 in (495 mm)
4480 lb (2032 kg)
3080 lb (1397 kg)
7560 lb (3429 kg)

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

Dates of tests: March 25-April 20, 2009.

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) 0.8470 Fuel weight 7.052 lbs/gal (0.845 kg/l) Oil SAE 15W40 API service classification CF/CH-4 Transmission and hydraulic lubricant John Deere Hy-Gard Fluid Front axle lubricant SAE 80W90 API GL-5 Total time engine was operated 15.0 hours

ENGINE: Make John Deere Diesel Type four cylinder vertical with turbocharger Serial No. *PE40451753433* Crankshaft lengthwise Rated engine speed 2400 Bore and stroke 4.19" x 5.00" (106.4 mm x 127.0 mm) Compression ratio 17.6 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 radiator for transmission and hydraulic oil Fuel filter one paper element and sediment bowl Muffler underhood Exhaust vertical Cooling medium temperature control one thermostat

ENGINE OPERATING PARAMETERS: Fuel rate: 34.8 - 38.6 lb/h (15.8 - 17.5 kg/h) High idle: 2600 - 2650 rpm Turbo boost: nominal 10.9 - 13.8 psi (75 - 95 kPa) as measured 12.1 psi (83 kPa)

CHASSIS: Type front wheel assist Serial No. *LV5093E160357* Tread width rear 54.8" (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 1.04 (1.68) 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 5.60 (9.02) eighth 7.51 (12.08) ninth 8.72 (14.04) tenth 11.87 (19.11) eleventh 16.20 (26.08) twelfth 21.71 (34.94) reverse 1.14 (1.84), 1.55 (2.50), 2.12 (3.41), 2.84 (4.57), 3.29 (5.30), 4.48 (7.21), 6.11 (9.84), 8.19 (13.18), 9.51 (15.31), 12.95 (20.84), 17.68 (28.45), 23.68 (38.11) Clutch single wet disc operated by foot pedal Brakes single wet disc hydraulically 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 1716 engine rpm Unladen tractor mass 7385 lb (3349 kg)

HYDRAULIC PERFORMANCE

CATEGORY: II

Quick Attach: None

OECD Static test

Maximum force exerted through whole range:	3213 lbs	(14.3 kN)
i) Sustained pressure of the open relief valve:	2808 psi	(194 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:	16.4 GPM	(62.1 l/min)
Delivery pressure:	2437 psi	(168 bar)
Power:	23.3 HP	(17.4 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 151°F (66°C).

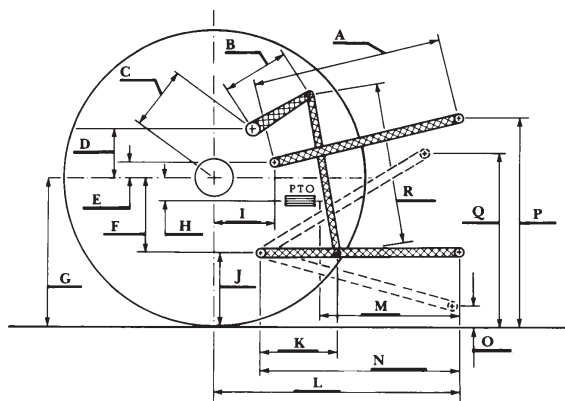
We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1948, July 30, 2009.

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 @ 1716 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)
65.33 (48.72)	1715	3.64 (13.79)	0.393 (0.239)	17.95 (3.53)
48.61 (36.25)	1714	2.81 (10.64)	0.408 (0.248)	17.30 (3.41)
32.36 (24.13)	1713	1.95 (7.40)	0.426 (0.259)	16.56 (3.26)
16.25 (12.12)	1716	1.17 (4.42)	0.506 (0.308)	13.92 (2.74)
1.29 (0.96)	1721	0.60 (2.27)	3.282 (1.998)	2.15 (0.42)

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)
76.06 (56.72)	2409	4.97 (18.84)	0.461 (0.281)	15.29 (3.01)
48.81 (36.39)	2417	3.69 (13.97)	0.533 (0.324)	13.24 (2.61)
32.38 (24.15)	2408	2.81 (10.63)	0.611 (0.372)	11.54 (2.27)
16.26 (12.12)	2412	1.93 (7.32)	0.838 (0.510)	8.41 (1.66)
1.33 (0.99)	2409	1.29 (4.88)	6.860 (4.176)	1.03 (0.20)



John Deere 5093E Ltd Diesel

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln