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2018

Test 2193: John Deere 5100R OC

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 2193

JOHN DEERE 5100R DIESEL

16 SPEED

Open center hydraulic system

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption		Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)	
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—566 rpm)						
88.17 (65.75)	2201	5.31 (20.12)	0.423 (0.258)	16.59 (3.27)	0.23 (0.86)	Fuel used during active exhaust regeneration-0.49 gal (1.87 l) (see note 1, p.2)
Standard Power Take-off Speed(540 rpm)						
94.51 (70.47)	2100	5.43 (20.54)	0.403 (0.245)	17.41 (3.43)	0.25 (0.93)	
Maximum Power (1 hour)						
100.11 (74.66)	1851	5.34 (20.22)	0.375 (0.228)	18.74 (3.69)	0.28 (1.05)	

VARYING POWER AND FUEL CONSUMPTION

88.17 (65.75)	2201	5.31 (20.12)	0.423 (0.258)	16.59 (3.27)	0.23 (0.86)	Air temperature
77.10 (57.49)	2266	4.89 (18.52)	0.446 (0.271)	15.76 (3.10)	0.20 (0.77)	73°F(23°C)
58.20 (43.40)	2281	4.10 (15.52)	0.495 (0.301)	14.19 (2.80)	0.14 (0.51)	Relative humidity
39.12 (29.17)	2293	3.32 (12.55)	0.595 (0.362)	11.80 (2.32)	0.07 (0.27)	21%
19.74 (14.72)	2310	2.46 (9.33)	0.876 (0.533)	8.01 (1.58)	0.05 (0.17)	Barometer
0.72 (0.53)	2324	1.84 (6.95)	17.999 (10.949)	0.39 (0.08)	0.02 (0.08)	28.76" Hg(97.40 kPa)

Maximum torque - 302 lb.-ft. (410 Nm) at 1401 rpm
 Maximum torque rise - 43.6%
 Torque rise at 1762 engine rpm - 38%
 Power increase at 1851 engine rpm - 13.6%

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 7th (B3) gear	72.5	71.5
Transport in 16th (D4) gear	74.4	74.4
Bystander in 16th (D4) gear	84.2	84.2

Horizontal distances of drawbar hitch point behind rear wheel axis - 32.5" (825 mm), 34.4" (875 mm)

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 16.9R30; **, 12 (85)
 Two 11.2R24; **, 18 (125)
 16.0 in (405 mm)
 5955 lb (2701 kg)
 3655 lb (1658 kg)
 9610 lb (4359 kg)

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

Dates of tests: April 18 - 24, 2018

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

CONSUMABLE Fluids, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8434 **Fuel weight** 7.023 lbs/gal (0.842 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE 10W30 API service classification** CJ-4 **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere Hy-Gard fluid **Total time engine was operated** 9.0 hours

ENGINE: Make John Deere **Diesel Type** four cylinder vertical with turbocharger, air to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** *PE4045U059806* **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.19" x 5.00" (106.5 mm x 127.0 mm) **Compression ratio** 16.9 to 1 **Displacement** 276 cu in (4525 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **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 **Fuel cooler** radiator for return fuel **Exhaust** regenerative aftertreatment system consisting of DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) with an underhood muffler and vertical exhaust **Cooling medium temperature control** two thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 36.2 - 39.2 lb/h (16.4 - 17.8 kg/h) **High idle:** 2300 - 2350 rpm **Turbo boost:** nominal 18.1 - 21.0 psi (125 - 145 kPa) as measured 19.4 psi (134 kPa)

CHASSIS: Type front wheel assist **Serial No.** *1LV5100RPH1400226* **Tread width** rear 58.0" (1473 mm) to 71.6" (1819 mm) front 58.6" (1488 mm) to 81.5" (2070 mm) **Wheelbase** 88.6" (2250 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.29 (2.07) second 1.59 (2.56) third 1.97 (3.17) fourth 2.41 (3.88) fifth 2.98 (4.79) sixth 3.67 (5.91) seventh 4.55 (7.33) eighth 5.59 (8.99) ninth 5.76 (9.27) tenth 7.11 (11.45) eleventh 8.81 (14.18) twelfth 10.81 (17.40) thirteenth 12.89 (20.75) fourteenth 15.93 (25.63) fifteenth 19.73 (31.75) sixteenth 24.21 (38.96)

HYDRAULIC PERFORMANCE

CATEGORY: II

Quick Attach: None

OECD Static test

		<u>lift cylinders</u>
Maximum force exerted through whole range:	7720 lbs (34.3 kN) (2 x 75 mm)	
	8678 lbs (38.6 kN) (2 x 80 mm)	
	<u>single outlet set</u>	<u>two outlet sets combined</u>
i) Sustained pressure of the open relief valve:	2860 psi (197 bar)	2887 psi (199 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	20.9 GPM (79.1 l/min)	20.9 GPM (79.3 l/min)
iii) Pump delivery rate at maximum hydraulic power:	20.5 GPM (77.7 l/min)	20.8 GPM (78.7 l/min)
Delivery pressure:	2457 psi (169 bar)	2614 psi (180 bar)
Power:	29.4 HP (21.9 kW)	31.7 HP (23.6 kW)

reverse 1.37 (2.21), 1.70 (2.73), 2.10 (3.38), 2.58 (4.15), 3.18 (5.11), 3.92 (6.31), 4.86 (7.82), 5.96 (9.59), 6.15 (9.89), 7.59 (12.22), 9.40 (15.13), 11.54 (18.57), 13.76 (22.15), 17.00 (27.35), 18.64 (30.00), 18.64 (30.00) electronically limited **Clutch** wet disc hydraulically actuated by foot pedal **Brakes** wet disc hydraulically actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2100 engine rpm, Economy PTO 540 rpm at 1645 engine rpm **Unladen tractor mass** 9435 lb (4279 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: The manufacturer declares that the average time between active regenerations is 150 hours. A 3% power decrease was observed during the active exhaust regeneration.

NOTE 2: The performance data on this report applies to tractors with an open center hydraulic system.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures.

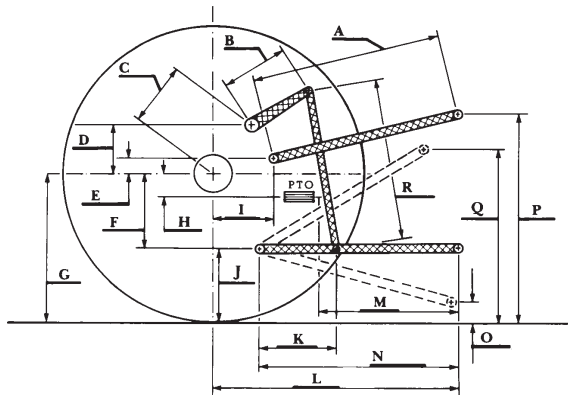
We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2193**, June 15, 2018.

Roger M. Hoy
Director

M.F. Kocher
P.J. Jasa
J.D. Luck
Board of Tractor Test Engineers

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	26.4	670
B	14.1	358
C	17.7	449
D	15.0	380
E	14.4	365
F	8.8	223
G	31.3	795
H	0.2	4
I	14.4	365
J	22.5	572
K	17.5	444
L	41.7	1060
M	23.0	585
N	33.1	840
O	9.1	230
P	46.5	1182
Q	38.4	975
R	32.3	820



RECOMMENDED CITATION FORMAT:

NTTL.(2018). Nebraska tractor test 2193 for John Deere 5100R OC Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>

Shiftable PTO Performance

Economy mode

540 PTO rpm @ 1645 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption	
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)
93.59 (69.79)	1645	4.86 (18.40)	0.365 (0.222)	19.25 (3.79)	0.26 (0.99)
70.17 (52.33)	1643	3.74 (14.17)	0.375 (0.228)	18.75 (3.69)	0.18 (0.68)
46.79 (34.89)	1643	2.72 (10.31)	0.409 (0.249)	17.17 (3.38)	0.12 (0.44)
23.43 (17.47)	1648	1.80 (6.83)	0.541 (0.329)	12.99 (2.56)	0.03 (0.12)
0.61 (0.46)	1645	1.11 (4.21)	12.792 (7.781)	0.55 (0.11)	0.02 (0.09)

Normal mode

540 PTO rpm @ 2100 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption	
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)
93.64 (69.83)	2102	5.35 (20.25)	0.401 (0.244)	17.51 (3.45)	0.24 (0.91)
70.19 (52.34)	2099	4.25 (16.08)	0.425 (0.259)	16.52 (3.25)	0.15 (0.58)
46.81 (34.91)	2104	3.35 (12.67)	0.502 (0.305)	13.99 (2.76)	0.08 (0.31)
23.43 (17.47)	2101	2.27 (8.58)	0.679 (0.413)	10.34 (2.04)	0.03 (0.13)
0.53 (0.39)	2100	1.56 (5.92)	20.844 (12.679)	0.34 (0.07)	0.01 (0.02)



JOHN DEERE 5100R DIESEL

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University of Nebraska-Lincoln