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2018

## Test 2196: John Deere 5115R PFC

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# NEBRASKA OECD TRACTOR TEST 2196—SUMMARY 1144

## JOHN DEERE 5115R DIESEL

### 16 SPEED

PFC 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)	
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>						
<b>Rated Engine Speed—(PTO speed—566 rpm)</b>						
102.93 (76.75)	2201	5.99 (22.67)	0.409 (0.249)	17.19 (3.39)	0.27 (1.02)	Fuel used during active exhaust regeneration-0.44 gal (1.67 l) (see note 1, p.2)
<b>Standard Power Take-off Speed (540 rpm)</b>						
109.53 (81.67)	2100	6.15 (23.27)	0.394 (0.240)	17.82 (3.51)	0.29 (1.09)	
<b>Maximum Power (1 hour)</b>						
113.79 (84.85)	1851	6.05 (22.91)	0.374 (0.227)	18.80 (3.70)	0.26 (0.99)	

#### VARYING POWER AND FUEL CONSUMPTION

102.93 (76.75)	2201	5.99 (22.67)	0.409 (0.249)	17.19 (3.39)	0.27 (1.02)	Air temperature
90.09 (67.18)	2269	5.46 (20.66)	0.425 (0.259)	16.51 (3.25)	0.22 (0.84)	73°F (23°C)
68.15 (50.82)	2284	4.49 (16.99)	0.462 (0.281)	15.19 (2.99)	0.15 (0.57)	Relative humidity
45.72 (34.09)	2297	3.56 (13.46)	0.546 (0.332)	12.86 (2.53)	0.09 (0.35)	18%
23.04 (17.18)	2314	2.54 (9.62)	0.775 (0.471)	9.07 (1.79)	0.08 (0.30)	Barometer
1.07 (0.80)	2328	1.79 (6.76)	11.693 (7.113)	0.60 (0.12)	0.02 (0.09)	28.74" Hg (97.31 kPa)

Maximum torque - 347 lb.-ft. (471 Nm) at 1349 rpm

Maximum torque rise - 41.4%

Torque rise at 1762 engine rpm - 35%

Power increase at 1851 engine rpm - 10.6%

#### DRAWBAR PERFORMANCE UNBALLASTED - FRONT DRIVE ENGAGED 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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing dry med bulb	Barom. inch Hg (kPa)
<b>Power at Rated Engine Speed—8th(B4) Gear</b>								
92.27 (68.81)	6232 (27.72)	5.55 (8.93)	2200	5.5	0.457 (0.278)	15.37 (3.03)	0.023 (0.014)	198 52 28.44 (92) (11) (96.29)
<b>75% of Pull at Rated Engine Speed—8th(B4) Gear</b>								
72.18 (53.82)	4634 (20.61)	5.84 (9.40)	2274	3.8	0.490 (0.298)	14.34 (2.82)	0.023 (0.014)	198 63 28.38 (92) (17) (96.11)
<b>50% of Pull at Rated Engine Speed—8th(B4) Gear</b>								
49.22 (36.70)	3095 (13.77)	5.97 (9.60)	2290	2.5	0.567 (0.345)	12.39 (2.44)	0.023 (0.014)	195 63 28.38 (91) (17) (96.11)
<b>75% of Pull at Reduced Engine Speed—10th(C2) Gear</b>								
72.22 (53.85)	4648 (20.68)	5.83 (9.38)	1782	3.9	0.424 (0.258)	16.56 (3.26)	0.025 (0.015)	193 66 28.35 (89) (19) (96.00)
<b>50% of Pull at Reduced Engine Speed—10th(C2) Gear</b>								
49.49 (36.90)	3102 (13.80)	5.99 (9.63)	1804	2.5	0.465 (0.283)	15.10 (2.97)	0.024 (0.014)	190 66 28.35 (88) (19) (96.00)

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

**Dates of tests:** April 5 - 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** 16.5 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.** \*PE4045U057001\* **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:** 39.9 - 43.1 lb/h (18.1 - 19.5 kg/h) **High idle:** 2300 - 2350 rpm **Turbo boost:** nominal 16.7 - 19.6 psi (115 - 135 kPa) as measured 17.4 psi (120 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** \*1LV5115RCHH400190\* **Tread width** rear 60.0" (1525 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 1.35 (2.17) second 1.67 (2.68) third 2.07 (3.33) fourth 2.54 (4.08) fifth 3.13 (5.03) sixth 3.86 (6.21) seventh 4.78 (7.70) eighth 5.87 (9.45) ninth 6.05 (9.74) tenth 7.48 (12.03) eleventh 9.26 (14.90) twelfth 11.36 (18.28) thirteenth 13.55 (21.81) fourteenth 16.73 (26.93) fifteenth 20.73 (33.36) sixteenth 24.86 (40.00) electronically limited

## DRAWBAR PERFORMANCE

### UNBALLASTED - FRONT DRIVE ENGAGED-2200 ENGINE 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)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
5th(B1) Gear										
69.69 (51.96)	9431 (41.95)	2.78 (4.47)	2271	14.3	0.538 (0.327)	13.06 (2.57)	0.025 (0.015)	195 (91)	49 (9)	28.46 (96.38)
6th(B2) Gear										
84.85 (63.27)	9204 (40.94)	3.46 (5.57)	2248	12.5	0.503 (0.306)	13.96 (2.75)	0.023 (0.014)	196 (91)	49 (10)	28.46 (96.36)
7th(B3) Gear										
90.54 (67.52)	7675 (34.14)	4.43 (7.12)	2199	7.6	0.467 (0.284)	15.04 (2.96)	0.021 (0.013)	196 (91)	50 (10)	28.44 (96.31)
8th(B4) Gear										
92.27 (68.81)	6232 (27.72)	5.55 (8.93)	2200	5.5	0.457 (0.278)	15.37 (3.03)	0.023 (0.014)	198 (92)	52 (11)	28.44 (96.29)
9th(C1) Gear										
92.13 (68.70)	6022 (26.79)	5.74 (9.24)	2200	5.3	0.456 (0.278)	15.39 (3.03)	0.020 (0.012)	196 (91)	55 (13)	28.42 (96.24)
10th(C2) Gear										
92.42 (68.91)	4829 (21.48)	7.18 (11.55)	2200	4.0	0.454 (0.276)	15.45 (3.04)	0.022 (0.013)	201 (94)	56 (13)	28.40 (96.17)
11th(C3) Gear										
92.60 (69.05)	3872 (17.22)	8.97 (14.44)	2199	3.1	0.455 (0.277)	15.45 (3.04)	0.028 (0.017)	202 (94)	57 (14)	28.39 (96.14)

### UNBALLASTED - FRONT DRIVE ENGAGED-1850 ENGINE 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)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
5th(B1) Gear										
69.34 (51.70)	9435 (41.97)	2.76 (4.44)	2271	14.8	0.540 (0.329)	13.00 (2.56)	0.025 (0.015)	195 (91)	49 (9)	28.46 (96.38)
6th(B2) Gear										
84.87 (63.29)	9207 (40.95)	3.46 (5.57)	2250	12.6	0.503 (0.306)	13.96 (2.75)	0.024 (0.014)	196 (91)	50 (10)	28.45 (96.33)
7th(B3) Gear										
93.60 (69.79)	8759 (38.96)	4.01 (6.45)	2057	10.5	0.463 (0.281)	15.18 (2.99)	0.023 (0.014)	198 (92)	52 (11)	28.43 (96.28)
8th(B4) Gear										
97.34 (72.58)	8078 (35.93)	4.52 (7.27)	1850	8.7	0.434 (0.264)	16.20 (3.19)	0.020 (0.012)	199 (93)	53 (12)	28.44 (96.31)
9th(C1) Gear										
98.19 (73.22)	7860 (34.96)	4.69 (7.54)	1850	8.3	0.431 (0.262)	16.30 (3.21)	0.021 (0.013)	198 (92)	56 (13)	28.41 (96.21)
10th(C2) Gear										
100.61 (75.02)	6367 (28.32)	5.93 (9.54)	1850	5.9	0.421 (0.256)	16.66 (3.28)	0.021 (0.013)	200 (93)	57 (14)	28.40 (96.16)
11th(C3) Gear										
101.08 (75.37)	5083 (22.61)	7.46 (12.01)	1850	4.4	0.417 (0.254)	16.84 (3.32)	0.022 (0.013)	202 (94)	58 (14)	28.39 (96.14)
12th(C4) Gear										
101.78 (75.89)	4135 (18.39)	9.23 (14.85)	1848	3.3	0.416 (0.253)	16.89 (3.33)	0.022 (0.013)	200 (93)	59 (15)	28.39 (96.14)

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 460/85R30;\*\*\*,12(85)  
 Two 320/85R24;\*\*\*,14(95)  
 16.5 in (420 mm)  
 6195 lb (2810 kg)  
 3760 lb (1706 kg)  
 9955 lb (4516 kg)

reverse 1.44 (2.32), 1.78 (2.87), 2.21 (3.55), 2.71 (4.36), 3.34 (5.37), 4.12 (6.63), 5.11 (8.22), 6.26 (10.08), 6.46 (10.39), 7.99 (12.84), 9.88 (15.90), 12.12 (19.51), 14.46 (23.27), 17.86 (28.74), 18.65 (30.00), 18.65 (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, 1000 rpm at 2103 engine rpm **Unladen tractor mass** 9780 lb (4436 kg)

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**NOTE 1:** The manufacturer declares that the average time between active regenerations is 150 hours. A 7% power loss was observed during the active exhaust regeneration.

**NOTE 2:** The performance data on this report applies to tractors with a Pressure-and-Flow Compensated(PFC) hydraulic system.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor exceeded the 73 dB(A) sound power claim, with front drive engaged, by 4.7% (0.2 dB(A)). The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2196**, Nebraska Summary 1144, June 15, 2018 .

Roger M. Hoy  
 Director

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

## Shiftable PTO Performance

### Economy mode 540 PTO rpm @ 1645 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption Gal/hr (l/h)
106.83 (79.67)	1644	5.57 (21.07)	0.366 (0.223)	19.19 (3.78)	0.27 (1.03)
80.21 (59.82)	1648	4.27 (16.16)	0.374 (0.227)	18.79 (3.70)	0.21 (0.79)
53.52 (39.91)	1645	3.04 (11.52)	0.400 (0.243)	17.58 (3.46)	0.13 (0.49)
26.77 (19.96)	1640	1.94 (7.33)	0.508 (0.309)	13.83 (2.72)	0.04 (0.16)
0.65 (0.48)	1647	1.11 (4.18)	11.997 (7.297)	0.59 (0.12)	0.01 (0.03)

### Normal mode 540 PTO rpm @ 2100 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption Gal/hr (l/h)
106.77 (79.62)	2096	5.99 (22.68)	0.394 (0.240)	17.82 (3.51)	0.25 (0.95)
80.17 (59.79)	2104	4.73 (17.91)	0.414 (0.252)	16.94 (3.34)	0.21 (0.80)
53.51 (39.90)	2100	3.56 (13.46)	0.467 (0.284)	15.05 (2.96)	0.12 (0.44)
26.83 (20.01)	2102	2.40 (9.09)	0.628 (0.382)	11.18 (2.20)	0.05 (0.19)
0.63 (0.47)	2098	1.55 (5.87)	17.200 (10.462)	0.41 (0.08)	0.02 (0.08)

<b>TRACTOR SOUND LEVEL WITH CAB</b>	<b>Front Wheel Drive</b>	
	<b>Engaged dB(A)</b>	<b>Disengaged dB(A)</b>
At no load in 7th(B3) gear	73.2	72.7
Transport in 16th(D4) gear		75.6
Bystander in 16th(D4) gear		82.3

## HYDRAULIC PERFORMANCE

CATEGORY: II

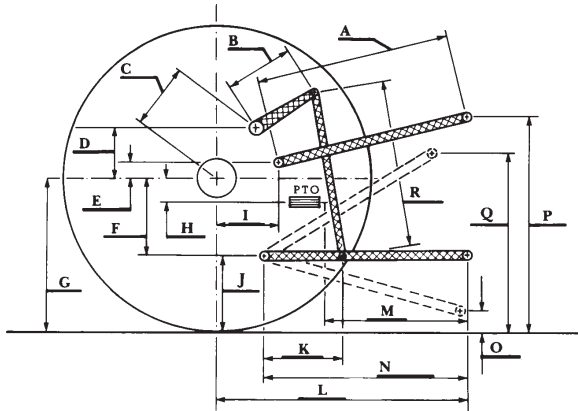
Quick Attach: None

OECD Static test

	lift cylinders	
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:	2873 psi (198 bar)	2883 psi (199 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	29.0 GPM (109.6 l/min)	31.1 GPM (117.7 l/min)
iii) Pump delivery rate at maximum hydraulic power:	27.0 GPM (102.4 l/min)	30.1 GPM (114.1 l/min)
Delivery pressure:	2368 psi (163 bar)	2609 psi (180 bar)
Power:	37.4 HP (27.9 kW)	45.9 HP (34.2 kW)

## 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 OECD tractor test 2196 for John Deere 5115R PFC Diesel.

Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



### JOHN DEERE 5115R DIESEL

Institute of Agriculture and Natural Resources  
University of Nebraska–Lincoln