

# NEBRASKA TRACTOR TEST 2116A

## JOHN DEERE 5100M DIESEL

### 16 SPEED

Chassis Serial numbers 700000 and higher

#### POWER TAKE-OFF PERFORMANCE

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)	Mean Atmospheric Conditions
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>						
<b>Rated Engine Speed—(PTO speed—565 rpm)</b>						
87.25 (65.06)	2197	5.36 (20.31)	0.432 (0.263)	16.26 (3.20)	0.22 (0.83)	Fuel used during active exhaust regeneration-0.71 gal (2.69 l) (see note 1, p.2)
<b>Standard Power Take-off Speed (540 rpm)</b>						
87.40 (65.18)	2100	5.20 (19.67)	0.418 (0.254)	16.82 (3.31)	0.22 (0.84)	
<b>Maximum Power (1 hour)</b>						
87.40 (65.18)	2100	5.20 (19.67)	0.418 (0.254)	16.82 (3.31)	0.22 (0.84)	

#### VARYING POWER AND FUEL CONSUMPTION

87.25 (65.06)	2197	5.36 (20.31)	0.432 (0.263)	16.26 (3.20)	0.22 (0.83)	Air temperature
75.79 (56.52)	2246	4.92 (18.61)	0.456 (0.278)	15.41 (3.04)	0.20 (0.75)	74°F (23°C)
57.63 (42.97)	2275	4.10 (15.51)	0.500 (0.304)	14.06 (2.77)	0.17 (0.66)	Relative humidity
38.88 (28.99)	2300	3.34 (12.64)	0.604 (0.367)	11.65 (2.29)	0.15 (0.55)	24%
19.40 (14.47)	2300	2.50 (9.45)	0.905 (0.550)	7.77 (1.53)	0.13 (0.50)	Barometer
0.75 (0.56)	2300	1.90 (7.20)	17.809 (10.833)	0.39 (0.08)	0.16 (0.61)	28.75" Hg (97.36 kPa)

Maximum torque - 264 lb.-ft. (358 Nm) at 1401 rpm

Maximum torque rise - 27.1%

Torque rise at 1750 engine rpm - 20%

Power increase at 2100 engine rpm - 0.1%

#### TRACTOR SOUND LEVEL WITH CAB

	Front Wheel Drive Engaged dB(A)	Disengaged dB(A)
At no load in 7th (B3) gear	73.9	73.9
Transport in 16th (D4) gear		76.1
Bystander in 16th (D4) gear		79.6

Horizontal distances of drawbar hitch point behind rear wheel axis - 28.5" (725 mm), 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 18.4R30; \*\*, 12 (85)

Two 12.4R24; \*\*, 14 (95)

16.5 in (420 mm)

5655 lb (2565 kg)

3540 lb (1606 kg)

9195 lb (4171 kg)

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

**Dates of tests:** March 31 to April 2, 2015

**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)** 0.8447 **Fuel weight** 7.033 lbs/gal (0.843 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** SAE 80W90 **API GL-5 Total time engine was operated** 8.5 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.** \*PE4045U006487\* **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:** 35.5 - 38.4 lb/h (16.1 - 17.4 kg/h) **High idle:** 2275 - 2325 rpm **Turbo boost:** nominal 18.1 - 21.0 psi (125 - 145 kPa) as measured 19.9 psi (137 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** \*1LV5100MPEJ741118\* **Tread width** rear 59.4" (1508 mm) to 71.4" (1813 mm) front 52.8" (1342 mm) to 77.0" (1957 mm) **Wheelbase** 92.5" (2350 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.21 (1.95) second 1.55 (2.49) third 1.87 (3.01) fourth 2.23 (3.60) fifth 2.92 (4.70) sixth 3.73 (6.00) seventh 4.52 (7.28) eighth 5.41 (8.70) ninth 7.16 (11.52) tenth 9.14 (14.71) eleventh 11.07 (17.81) twelfth 11.08 (17.83) thirteenth 13.24 (21.31) fourteenth 14.13 (22.74) fifteenth 17.12 (27.55) sixteenth 20.47 (32.94)

## HYDRAULIC PERFORMANCE

CATEGORY: II

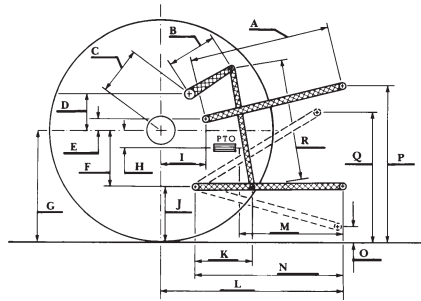
Quick Attach: None

OECD Static test

		<u>lift cylinders</u>	
Maximum force exerted through whole range:	4858 lbs (21.6 kN)	(2 x 56 mm)	
	6390 lbs (28.4 kN)	(2 x 63 mm)	
		<u>single outlet set</u>	<u>two outlet sets combined</u>
i) Sustained pressure of the open relief valve:	2911 psi (201 bar)	2922 psi (201 bar)	
ii) Pump delivery rate at minimum pressure and rated engine speed:	19.5 GPM (73.8 l/min)	19.6 GPM (74.1 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	17.6 GPM (66.5 l/min)	18.1 GPM (68.6 l/min)	
Delivery pressure:	2321 psi (160 bar)	2383 psi (164 bar)	
Power:	23.8 HP (17.7 kW)	25.2 HP (18.8 kW)	

### HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	25.2	640
B	12.6	320
C	17.7	449
D	15.0	380
E	14.8	375
F	8.8	223
G	29.3	745
H	0.2	4
I	15.4	390
J	20.5	522
K	17.5	444
L	41.7	1060
M	23.0	585
N	33.1	840
O	9.1	230
P	44.6	1132
Q	36.2	919
R	27.8	705



The following data applies to John Deere 5100M models for production MY2018 and beyond.

CATEGORY: II

Quick Attach: None

OECD Static test

		<u>lift cylinders</u>	
Maximum force exerted through whole range:	5161 lbs (23.0 kN)	(2 x 65 mm)	
	5958 lbs (26.5 kN)	(1 x 65 mm and 1 x 75 mm)	

### HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	24.9	632
B	14.1	358
C	17.7	449
D	15.0	380
E	11.8	300
F	8.8	223
G	31.3	795
H	0.2	4
I	16.1	410
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

reverse 1.34 (2.15), 1.70 (2.74), 2.06 (3.32), 2.47 (3.97), 3.22 (5.18), 4.11 (6.62), 4.98 (8.02), 5.95 (9.58), 7.89 (12.70), 10.07 (16.21), 12.19 (19.62), 12.21 (19.65), 14.60 (23.49), 15.57 (25.06), 18.87 (30.37), 22.56 (36.30) **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** 9020 lb (4091 kg)

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

**NOTE 1:** The manufacturer declares that the average time between active regenerations is 100 hours, while operated in Auto Filter Cleaning Mode, at rated speed, full load, under steady state conditions. A 2% power increase was observed during the active exhaust regeneration.

**NOTE 2:** The performance data on this report applies to tractors with chassis serial numbers that end with 700000 and higher.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor was 3.9 percentage points short of the manufacturer's claim of 4% power bulge and 10 percentage points short of the 30% torque rise claim.

**Report reissued.** Three point lift data for tractors denoted Model Year 2018 added November, 2018.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2116A**, December 19, 2018.

Roger M. Hoy  
Director

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

## RECOMMENDED CITATION FORMAT:

NTTL.(2018). Nebraska Tractor test 2116A for John Deere 5100M 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 Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption Gal/hr (l/h)
79.95 (59.62)	1645	4.31 (16.33)	0.380 (0.231)	18.53 (3.65)	0.26 (0.98)
60.16 (44.86)	1649	3.39 (12.81)	0.396 (0.241)	17.77 (3.50)	0.21 (0.81)
40.21 (29.98)	1650	2.53 (9.56)	0.442 (0.269)	15.92 (3.14)	0.16 (0.60)
20.06 (14.96)	1646	1.65 (6.26)	0.580 (0.353)	12.13 (2.39)	0.16 (0.61)
0.72 (0.54)	1642	1.11 (4.20)	10.872 (6.613)	0.65 (0.13)	0.15 (0.58)

### 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)
80.13 (59.75)	2103	4.83 (18.28)	0.424 (0.258)	16.60 (3.27)	0.21 (0.79)
60.27 (44.94)	2106	3.91 (14.79)	0.456 (0.277)	15.43 (3.04)	0.17 (0.65)
40.20 (29.98)	2105	3.01 (11.39)	0.526 (0.320)	13.36 (2.63)	0.15 (0.55)
20.04 (14.95)	2103	2.21 (8.37)	0.776 (0.472)	9.06 (1.79)	0.13 (0.49)
0.74 (0.55)	2097	1.60 (6.07)	15.331 (9.325)	0.46 (0.09)	0.16 (0.59)



**JOHN DEERE 5100M DIESEL**

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