

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

---

2012

## Test 2038: John Deere 5115M

Nebraska Tractor Test Lab

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

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



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

---

Nebraska Tractor Test Lab, "Test 2038: John Deere 5115M" (2012). *Nebraska Tractor Tests*. 2455.  
<https://digitalcommons.unl.edu/tractormuseumlit/2455>

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 OECD TRACTOR TEST 2038—SUMMARY 837

## JOHN DEERE 5115M DIESEL

### 16 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					
<b>Rated Engine Speed—(PTO speed—566 rpm)</b>					
98.82 (73.69)	2201	6.03 (22.81)	0.430 (0.262)	16.40 (3.23)	Fuel used during active exhaust regeneration - 0.66 gal (2.48 l) (see Note 1 p.2)
<b>Standard Power Take-off Speed (540 rpm)</b>					
102.52 (76.45)	2100	6.04 (22.88)	0.416 (0.253)	16.96 (3.34)	
<b>Maximum Power (1 hour)</b>					
103.42 (77.12)	1801	5.79 (21.93)	0.395 (0.240)	17.85 (3.52)	

#### VARYING POWER AND FUEL CONSUMPTION

98.82 (73.69)	2201	6.03 (22.81)	0.430 (0.262)	16.40 (3.23)	Air temperature
86.30 (64.35)	2259	5.50 (20.81)	0.449 (0.273)	15.70 (3.09)	77°F (25°C)
65.30 (48.69)	2279	4.59 (17.37)	0.495 (0.301)	14.23 (2.80)	Relative humidity
43.75 (32.62)	2300	3.54 (13.40)	0.570 (0.347)	12.36 (2.44)	53%
21.95 (16.37)	2301	2.87 (10.85)	0.921 (0.560)	7.66 (1.51)	Barometer
0.90 (0.67)	2300	1.68 (5.37)	13.156 (8.002)	0.54 (0.11)	28.63 Hg (96.95 kPa)

Maximum torque - 318 lb.-ft. (431 Nm) at 1602 rpm  
Maximum torque rise - 34.8%  
Torque rise at 1762 engine rpm - 30%  
Power increase at 1801 engine rpm - 4.7%

#### 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)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—8th (B4) Gear</b>									
89.74 (66.92)	6485 (28.84)	5.19 (8.35)	2200	4.7	0.486 (0.296)	14.51 (2.86)	198 (92)	71 (21)	29.09 (98.51)
<b>75% of Pull at Maximum Power—8th (B4) Gear</b>									
70.22 (52.36)	4841 (21.53)	5.44 (8.75)	2268	3.1	0.526 (0.320)	13.41 (2.64)	198 (92)	80 (26)	29.05 (98.37)
<b>50% of Pull at Maximum Power—8th (B4) Gear</b>									
47.51 (35.43)	3204 (14.25)	5.56 (8.95)	2290	2.0	0.614 (0.373)	11.48 (2.26)	195 (91)	80 (27)	29.04 (98.34)
<b>75% of Pull at Reduced Engine Speed—9th (C1) Gear</b>									
70.01 (52.20)	4862 (21.63)	5.40 (8.69)	1698	3.1	0.435 (0.265)	16.20 (3.19)	194 (90)	80 (27)	29.03 (98.31)
<b>50% of Pull at Reduced Engine Speed—9th (C1) Gear</b>									
47.57 (35.47)	3200 (14.23)	5.58 (8.97)	1732	2.0	0.469 (0.286)	15.02 (2.96)	191 (88)	80 (27)	29.03 (98.31)

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

**Dates of tests:** September 5 - 21, 2012

**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) 0.8467 Fuel weight 7.050 lbs/gal (0.845 kg/l) Oil SAE 15W40 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 19.0 hours

**ENGINE:** Make John Deere Diesel Type four cylinder vertical with turbocharger and air to air intercooler Serial No. \*PE4045R008992\* Crankshaft lengthwise Rated engine speed 2200 Bore and stroke 4.19" x 5.00" (106.5 mm x 127.0 mm) Compression ratio 16.8 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 particulate filter integrated within a vertical muffler Cooling medium temperature control one thermostat and variable speed fan

**ENGINE OPERATING PARAMETERS:** Fuel rate: 41.7 - 46.1 lb/h (18.9 - 20.9 kg/h) High idle: 2275 - 2325 rpm Turbo boost: nominal 15.2 - 18.1 psi (105 - 125 kPa) as measured 16.6 psi (114 kPa)

**CHASSIS:** Type front wheel assist Serial No. \*1LV5115MJCJ440085\* Tread width rear 59.4" (1508 mm) to 71.4" (1813 mm) front 52.8" (1342 mm) to 77.0" (1957 mm) Wheelbase 90.6" (2300 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio Nominal travel speeds mph (km/h) first 1.19 (1.91) second 1.52 (2.44) third 1.83 (2.95) fourth 2.19 (3.53) fifth 2.86 (4.61) sixth 3.65 (5.88) seventh 4.43 (7.13) eighth 5.29 (8.52) ninth 7.02 (11.29) tenth 8.95 (14.41) eleventh 10.84 (17.44) twelfth 10.85 (17.46) thirteenth 12.97 (20.88) fourteenth 13.84 (22.27) fifteenth 16.77 (26.99) sixteenth 20.05 (32.27) reverse 1.30 (2.10), 1.67 (2.69), 2.02 (3.25), 2.42 (3.89), 3.16 (5.08), 4.03 (6.48), 4.88 (7.85), 5.83 (9.39), 7.73 (12.44), 9.87 (15.88), 11.94 (19.22), 11.96 (19.25), 14.30 (23.01), 15.25 (24.54), 18.49 (29.75), 22.10 (35.56)

## 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)	Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
6th (B2)Gear									
78.00 (58.16)	8790 (39.10)	3.33 (5.36)	2250	13.6	0.541 (0.329)	13.03 (2.57)	196 (91)	64 (18)	29.10 (98.54)
7th (B3)Gear									
87.72 (65.41)	7740 (34.43)	4.25 (6.84)	2200	6.8	0.493 (0.300)	14.30 (2.82)	197 (92)	68 (20)	29.10 (98.54)
8th (B4)Gear									
89.74 (66.92)	6485 (28.84)	5.19 (8.35)	2200	4.7	0.486 (0.296)	14.51 (2.86)	198 (92)	71 (21)	29.09 (98.51)
9th (C1)Gear									
90.41 (67.42)	4857 (21.61)	6.98 (11.23)	2199	3.2	0.480 (0.292)	14.68 (2.89)	201 (94)	73 (23)	29.08 (98.48)
10th (C2)Gear									
89.99 (67.10)	3751 (16.69)	9.00 (14.48)	2201	2.4	0.480 (0.292)	14.68 (2.89)	201 (94)	76 (24)	29.08 (98.48)

### UNBALLASTED - FRONT DRIVE ENGAGED-1800 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)	Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
6th (B2)Gear									
78.60 (58.61)	8830 (39.28)	3.34 (5.37)	2250	13.4	0.540 (0.329)	13.05 (2.57)	195 (91)	63 (17)	29.10 (98.54)
7th (B3)Gear									
88.78 (66.20)	8178 (36.38)	4.07 (6.55)	2138	8.3	0.492 (0.299)	14.34 (2.83)	198 (92)	69 (21)	29.10 (98.54)
8th (B4)Gear									
92.51 (68.98)	7535 (33.52)	4.60 (7.40)	1987	6.4	0.462 (0.281)	15.27 (3.01)	198 (92)	72 (22)	29.09 (98.51)
9th (C1)Gear									
94.54 (70.49)	6283 (27.95)	5.64 (9.08)	1800	4.5	0.445 (0.271)	15.84 (3.12)	200 (93)	74 (23)	29.08 (98.48)
10th (C2)Gear									
95.25 (71.03)	4890 (21.75)	7.31 (11.76)	1800	3.2	0.442 (0.269)	15.96 (3.14)	200 (93)	76 (24)	29.07 (98.44)
11th (C3)Gear									
94.43 (70.42)	3976 (17.68)	8.91 (14.34)	1802	2.5	0.443 (0.269)	15.93 (3.14)	198 (92)	76 (24)	29.07 (98.44)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 7th(B3) gear	75.3	75.4
Transport in 16th (D4) gear		75.8
Bystander in 16th (D4) gear		79.0

## 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; \*\*\*, 12 (85)  
17.0 in (430 mm)  
5575 lb (2529 kg)  
3475 lb (1576 kg)  
9050 lb (4105 kg)

**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** 8875 lb (4026 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.

**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 136°F (58°C). The performance figures on this summary were taken from a test conducted under the OECD Code 2 test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2038**, Nebraska Summary 837, February 13, 2013.

Roger M. Hoy  
Director

M.R. Riley  
P.J. Jasa  
J.D. Luck  
Board of Tractor Test Engineers

# Economy mode 540 PTO rpm @ 1645 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)
98.30 (73.30)	1646	5.38 (20.37)	0.386 (0.235)	18.26 (3.60)
74.60 (55.63)	1665	4.16 (15.76)	0.393 (0.240)	17.92 (3.53)
49.25 (36.73)	1653	2.90 (10.98)	0.415 (0.253)	16.98 (3.35)
24.80 (18.49)	1657	1.88 (7.13)	0.535 (0.326)	13.17 (2.59)
1.05 (0.78)	1612	1.14 (4.31)	7.643 (4.652)	0.92 (0.18)

# Normal mode 540 PTO rpm @ 2100 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)
98.55 (73.49)	2104	5.79 (21.90)	0.414 (0.252)	17.03 (3.35)
74.10 (55.26)	2111	4.65 (17.59)	0.442 (0.269)	15.94 (3.14)
49.30 (36.76)	2107	3.47 (13.12)	0.496 (0.302)	14.23 (2.80)
24.60 (18.34)	2101	2.46 (9.33)	0.706 (0.430)	9.98 (1.97)
1.10 (0.82)	2109	1.21 (4.57)	7.732 (4.707)	0.91 (0.18)

## HYDRAULIC PERFORMANCE

CATEGORY: II

Quick Attach: None

OECD Static test

Maximum force exerted through whole range: 6390 lbs (28.4 kN) (2 x 63 mm) lift cylinders

i) Sustained pressure of the open relief valve: 2897 psi (200 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 20.9 GPM (78.9 l/min)

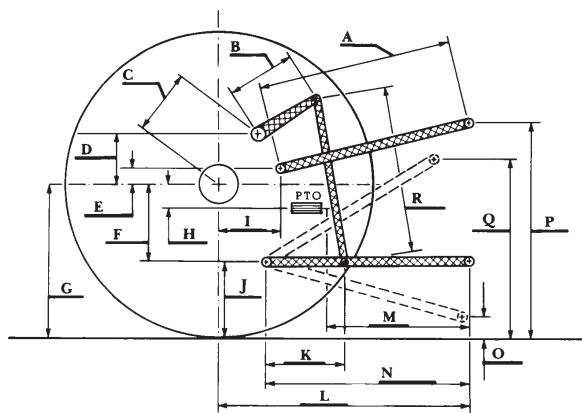
iii) Pump delivery rate at maximum hydraulic power: 19.3 GPM (73.2 l/min)

Delivery pressure: 2367 psi (163 bar)

Power: 26.7 HP (19.9 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



## JOHN DEERE 5115M DIESEL

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln