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2016

## Test 2144: John Deere 6120E

Nebraska Tractor Test Lab

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

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# NEBRASKA OECD TRACTOR TEST 2144—SUMMARY 1007

## JOHN DEERE 6120E DIESEL

### 12 SPEED

#### 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
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1065 rpm)						
101.19 (75.46)	2199	6.37 (24.10)	0.441 (0.268)	15.89 (3.13)	0.22 (0.83)	Fuel used during active exhaust regeneration-0.56 gal (2.14 l) (see note 1, p.2)
Power at 2100 engine rpm						
106.21 (79.20)	2100	6.41 (24.25)	0.423 (0.257)	16.57 (3.26)	0.22 (0.83)	
Standard Power Take-off Speed (1000 rpm)						
107.76 (80.36)	2065	6.41 (24.27)	0.417 (0.254)	16.81 (3.31)	0.22 (0.82)	
Maximum Power (1 hour)						
108.48 (80.90)	1950	6.26 (23.70)	0.404 (0.246)	17.33 (3.41)	0.20 (0.77)	

#### VARYING POWER AND FUEL CONSUMPTION

101.19 (75.46)	2199	6.37 (24.10)	0.441 (0.268)	15.89 (3.13)	0.22 (0.83)	Air temperature
87.01 (64.88)	2226	5.72 (21.67)	0.461 (0.280)	15.20 (2.99)	0.18 (0.67)	74°F (23°C)
65.86 (49.11)	2246	4.72 (17.85)	0.502 (0.305)	13.97 (2.75)	0.11 (0.43)	Relative humidity
44.29 (33.02)	2269	3.77 (14.27)	0.597 (0.363)	11.74 (2.31)	0.05 (0.21)	51%
22.54 (16.81)	2300	2.91 (11.03)	0.906 (0.551)	7.74 (1.52)	0.00 (0.01)	Barometer
1.25 (0.93)	2300	1.98 (7.49)	11.063 (6.729)	0.63 (0.12)	0.00 (0.01)	28.25" Hg (95.66 kPa)

Maximum torque - 328 lb.-ft. (445 Nm) at 1549 rpm

Maximum torque rise - 35.8%

Torque rise at 1760 engine rpm - 30%

Power increase at 1950 engine rpm - 7.2%

#### 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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Power at Rated Engine Speed—6th (C1) Gear										
89.58 (66.80)	5474 (24.35)	6.14 (9.88)	2200	3.2	0.494 (0.301)	14.18 (2.79)	0.023 (0.014)	186 (85)	59 (15)	28.69 (97.16)
75% of Pull at Rated Engine Speed—6th (C1) Gear										
69.40 (51.75)	4143 (18.43)	6.28 (10.11)	2233	2.5	0.539 (0.328)	13.00 (2.56)	0.022 (0.013)	185 (85)	60 (15)	28.71 (97.23)
50% of Pull at Rated Engine Speed—6th (C1) Gear										
47.21 (35.20)	2769 (12.32)	6.39 (10.28)	2254	1.6	0.627 (0.382)	11.17 (2.20)	0.021 (0.013)	186 (85)	60 (16)	28.72 (97.27)
75% of Pull at Reduced Engine Speed—8th (C2) Gear										
69.20 (51.60)	4152 (18.47)	6.25 (10.06)	1558	2.4	0.448 (0.272)	15.65 (3.08)	0.021 (0.013)	183 (84)	60 (16)	28.73 (97.30)
50% of Pull at Reduced Engine Speed—8th (C2) Gear										
46.80 (34.90)	2728 (12.13)	6.43 (10.35)	1590	1.5	0.497 (0.302)	14.10 (2.78)	0.021 (0.013)	182 (83)	59 (15)	28.74 (97.33)

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

**Dates of tests:** March 30 to April 12, 2016

**Manufacturer:** Industrious John Deere, Boulevard Valdez Sanchez # 470, Saltillo, Coahuila CP25005 Mexico

**CONSUMABLE Fluids, OIL and TIME: Fuel** No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8417 **Fuel weight** 7.008 lbs/gal (0.840 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE 15W-40 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:** 20.5 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.** \*PE4045U024173\* **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** two paper elements **Fuel cooler** radiator for pump return fuel **Exhaust** regenerative aftertreatment system consisting of DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) within a vertical muffler **Cooling medium temperature control** two thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 41.7 - 45.2 lb/h (18.9 - 20.5 kg/h) **High idle:** 2280 - 2320 rpm **Turbo boost:** nominal 18.9 - 21.8 psi (130 - 150 kPa) as measured 20.8 psi (140 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** \*1P06120EVF0001039\* **Tread width** rear 59.5" (1512 mm) to 79.2" (2012 mm) front 60.0" (1523 mm) to 80.0" (2033 mm) **Wheelbase** 96.5" (2450 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.80 (2.90) second 2.57 (4.14) third 3.42 (5.50) fourth 3.68 (5.93) fifth 5.25 (8.45) sixth 6.21 (9.99) seventh 6.98 (11.23) eighth 8.85 (14.25) ninth 9.51 (15.31) tenth 11.77 (18.94) eleventh 13.56 (21.83) twelfth 18.03 (29.01) reverse 1.65 (2.65), 2.34 (3.77), 3.12 (5.02), 3.36 (5.41), 4.79 (7.71), 5.67 (9.12), 6.37 (10.25), 8.08 (13.00), 8.67 (13.96) 10.74 (17.28), 12.38 (19.92), 16.45 (26.47)

# **DRAWBAR PERFORMANCE** **UNBALLASTED - FRONT DRIVE ENGAGED** **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 lb/hp.hr (kg/kW.h)	Temp.°F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd (A3) Gear										
83.21 (62.05)	10172 (45.25)	3.07 (4.94)	2196	11.9	0.536 (0.326)	13.07 (2.58)	0.024 (0.014)	186 (85)	59 (15)	28.68 (97.13)
4th (B1) Gear										
86.83 (64.75)	9388 (41.76)	3.47 (5.58)	2200	7.8	0.513 (0.312)	13.67 (2.69)	0.022 (0.013)	186 (85)	58 (14)	28.66 (97.06)
5th (B2) Gear										
89.54 (66.77)	6504 (28.93)	5.16 (8.30)	2200	3.7	0.497 (0.302)	14.11 (2.78)	0.021 (0.013)	185 (85)	55 (13)	28.66 (97.06)
6th(C1) Gear										
89.58 (66.80)	5474 (24.35)	6.14 (9.88)	2200	3.2	0.494 (0.301)	14.18 (2.79)	0.023 (0.014)	186 (85)	59 (15)	28.69 (97.16)
7th(B3) Gear										
88.16 (65.74)	4771 (21.22)	6.93 (11.15)	2200	2.7	0.503 (0.306)	13.93 (2.74)	0.023 (0.014)	185 (85)	59 (15)	28.70 (97.20)
8th(C2) Gear										
87.87 (65.52)	3723 (16.56)	8.86 (14.25)	2201	2.0	0.505 (0.307)	13.88 (2.73)	0.025 (0.015)	185 (85)	59 (15)	28.72 (97.27)

## **UNBALLASTED - FRONT DRIVE ENGAGED-1950 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 lb/hp.hr (kg/kW.h)	Temp.°F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd (A3) Gear										
82.10 (61.22)	10220 (45.46)	3.02 (4.85)	2192	13.3	0.545 (0.332)	12.86 (2.53)	0.024 (0.015)	186 (85)	58 (15)	28.70 (97.20)
4th (B1) Gear										
87.50 (65.25)	9737 (43.31)	3.37 (5.42)	2168	9.1	0.511 (0.311)	13.72 (2.70)	0.023 (0.014)	186 (85)	59 (15)	28.69 (97.16)
5th (B2) Gear										
95.13 (70.93)	7913 (35.20)	4.51 (7.26)	1949	5.2	0.460 (0.280)	15.25 (3.00)	0.020 (0.012)	185 (85)	57 (14)	28.69 (97.16)
6th(C1) Gear										
94.74 (70.65)	6594 (29.33)	5.39 (8.67)	1950	4.2	0.461 (0.281)	15.19 (2.99)	0.021 (0.013)	186 (85)	59 (15)	28.71 (97.23)
7th(B3) Gear										
94.68 (70.60)	5823 (25.90)	6.10 (9.82)	1950	3.5	0.461 (0.280)	15.20 (2.99)	0.023 (0.013)	187 (86)	60 (15)	28.72 (97.25)
8th(C2) Gear										
95.04 (70.87)	4566 (20.31)	7.81 (12.56)	1950	2.5	0.461 (0.280)	15.22 (3.00)	0.022 (0.013)	187 (86)	59 (15)	28.72 (97.27)

**Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc mechanically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2085 engine rpm or 1000 rpm at 2066 engine rpm **Unladen tractor mass** 10465 lb (4747 kg)

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

**NOTE 1.** The manufacturer declares that the average time between active regenerations is 100 hours. A 4% power loss was observed during the active exhaust regeneration.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. 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. **2144**, Nebraska Summary 1007, May 17, 2016.

Roger M. Hoy  
Director

M.F. Kocher  
S.K. Pitla  
P.J. Jasa  
Board of Tractor Test Engineers

### 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 460/85R34:\*\*;12(85)  
Two 340/85R24:\*\*;12(85)  
15.5 in (395 mm)  
6620 lb (3003 kg)  
4020 lb (1823 kg)  
10640 lb (4826 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE DISENGAGED**  
**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)	D.E.F Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Power at Rated Engine Speed—5th (B2) Gear</b>										
87.55 (65.28)	6556 (29.16)	5.01 (8.06)	2200	6.7	0.508 (0.309)	13.79 (2.72)	0.022 (0.014)	185 (85)	55 (13)	28.68 (97.13)
<b>75% of Pull at Rated Engine Speed—5th (B2) Gear</b>										
68.15 (50.82)	4919 (21.88)	5.20 (8.37)	2234	4.7	0.540 (0.329)	12.97 (2.55)	0.021 (0.013)	185 (85)	58 (15)	28.72 (97.27)
<b>50% of Pull at Rated Engine Speed—5th (B2) Gear</b>										
47.01 (35.05)	3312 (14.73)	5.33 (8.57)	2255	3.1	0.620 (0.377)	11.30 (2.23)	0.021 (0.013)	184 (84)	59 (15)	28.71 (97.23)
<b>75% of Pull at Reduced Engine Speed—7th (B3) Gear</b>										
67.99 (50.70)	4916 (21.87)	5.19 (8.35)	1678	4.7	0.452 (0.275)	15.51 (3.05)	0.023 (0.014)	184 (84)	60 (15)	28.73 (97.30)
<b>50% of Pull at Reduced Engine Speed—7th (B3) Gear</b>										
46.72 (34.84)	3281 (14.59)	5.34 (8.59)	1701	3.1	0.502 (0.305)	13.96 (2.75)	0.020 (0.012)	183 (84)	59 (15)	28.75 (97.37)
<b>MAXIMUM POWER IN SELECTED GEARS</b>										
4th (B1) Gear										
67.74 (50.51)	7590 (33.76)	3.35 (5.38)	2230	12.3	0.568 (0.345)	12.35 (2.43)	0.022 (0.014)	185 (85)	57 (14)	28.68 (97.13)
5th (B2) Gear										
87.55 (65.28)	6556 (29.16)	5.01 (8.06)	2200	6.7	0.508 (0.309)	13.79 (2.72)	0.022 (0.014)	186 (85)	55 (13)	28.68 (97.13)
6th (C1) Gear										
86.94 (64.83)	5425 (24.13)	6.01 (9.67)	2200	5.3	0.512 (0.311)	13.69 (2.70)	0.024 (0.014)	185 (85)	59 (15)	28.71 (97.23)
7th (B3) Gear										
87.16 (64.99)	4800 (21.35)	6.81 (10.96)	2200	4.5	0.511 (0.311)	13.71 (2.70)	0.024 (0.015)	185 (85)	59 (15)	28.70 (97.20)
8th (C2) Gear										
87.11 (64.96)	3741 (16.64)	8.74 (14.06)	2201	3.4	0.511 (0.311)	13.73 (2.70)	0.025 (0.015)	185 (85)	59 (15)	28.72 (97.26)

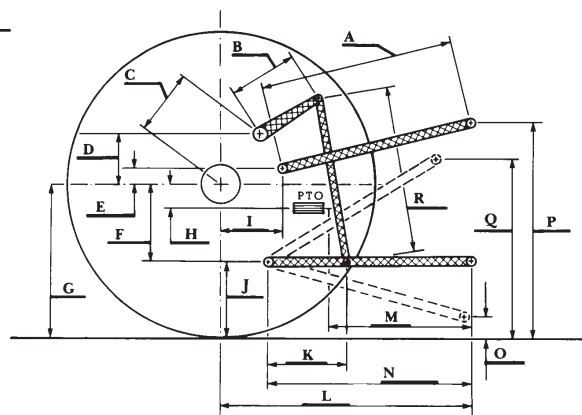
<b>TRACTOR SOUND LEVEL WITH CAB</b>	<b>Front Wheel Drive</b>	
	<b>Engaged dB(A)</b>	<b>Disengaged dB(A)</b>
At no load in 5th (B2) gear	77.4	78.1
Transport speed - no load - 12th (D3) gear		81.9
Bystander in 12th (D3) gear		83.2

## HYDRAULIC PERFORMANCE

CATEGORY: II

Quick Attach: No

	<u>Lift cylinders</u>
Maximum force exerted through whole range:	5722 lbs (25.5 kN) 2 x 70 mm 7304 lbs (32.5 kN) 2 x 80 mm
i) Maximum observed pressure:	2809 psi (194 bar) <b><u>two outlet sets combined</u></b>
ii) Pump delivery rate at minimum pressure and rated engine speed:	21.2 GPM (80.1 l/min)
iii) Pump delivery rate at maximum hydraulic power:	20.4 GPM (77.0 l/min)
Delivery pressure:	2404 psi (166 bar)
Power:	28.5 HP (21.3 kW) <b><u>single outlet set</u></b>
ii) Pump delivery rate at minimum pressure and rated engine speed:	20.9 GPM (79.1 l/min)
iii) Pump delivery rate at maximum hydraulic power:	20.4 GPM (77.3 l/min)
Delivery pressure:	2195 psi (151 bar)
Power:	26.1 HP (19.5 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	24.8	630
B	13.6	345
C	18.7	474
D	14.3	364
E	9.3	236
F	10.8	275
G	32.3	820
H	1.9	48
I	20.9	532
J	21.5	545
K	17.5	444
L	46.7	1187
M	24.9	632
N	33.1	840
O	9.0	230
P	45.5	1155
Q	38.0	965
R	30.5	775



### JOHN DEERE 6120E DIESEL

Institute of Agriculture and Natural Resources  
University of Nebraska–Lincoln