NEBRASKA TRACTOR TEST 1945
JOHN DEERE 4520 EHYDRO DIESEL
HYDROSTATIC
(Chassis S/N 650001 and higher)

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832
Dates of tests: April 20-22, 2009
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)
0.8470
Fuel weight
7.052 lbs/gal (0.845 kg/l)

Oil
SAE 15W40
API service classification
CG-4
Transmission and hydraulic lubricant
John Deere Hy-Gard Fluid

Total time engine was operated
9.5 hours

ENGINE: Make
John Deere Diesel
Type
four cylinder vertical with turbocharger and air to air intercooler
Serial No.
*PE4024R00284*
Crankshaft lengthwise
Rated engine speed
2400
Bore and stroke
3.386” x 4.134”
(86.0 mm x 105.0 mm)
Compression ratio
20.5 to 1
Displacement
149 cu in (2440 ml)
Starting system
12 volt
Lubrication
Air cleaner
one paper element and one polyester felt element
Oil filter
one full flow cartridge
Oil cooler
engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil
Fuel filter
one paper element
Muffler
underhood
Exhaust
horizontal
Cooling medium temperature control
one thermostat

ENGINE OPERATING PARAMETERS: Fuel rate:
26.0 - 28.0 lb/h (11.8 - 12.7 kg/h)
High idle:
2550 - 2650 rpm
Turbo boost:
nominal 15.2 - 16.7 psi (105 - 115 kPa) as measured 15.6 psi (108 kPa)

CHASSIS: Type
Front wheel assist
Serial No.
*LV4520H060464*
Tread width
rear 66.5” to 90.0” (1689 mm to 2285 mm)
front 54.6” to 56.7” (1386 mm to 1440 mm)
Wheelparse
71.5” (1816 mm)
Hydraulic control system
direct engine drive
Transmission
Hydrostatic
Infinitely variable within the ranges shown. The transmission has 3 mechanical ranges
Nominal travel speeds mph
A-0-4.1 (6.6), B-0-7.3 (11.7), C-0-17.0 (27.3)
reverse A-0-4.1 (6.6), B-0-7.3 (11.7), C-0-17.0 (27.3)
Clutch
none - travel speed is electronically controlled by foot pedal
Brakes
single wet disc mechanically operated by two foot pedals which can be locked together
Steering
hydrostatic
Power take-off
540 rpm at 2395 engine rpm or 540 rpm at 1735 engine rpm
Unladen tractor mass
3860 lb (1751 kg)

POWER TAKE-OFF PERFORMANCE

<table>
<thead>
<tr>
<th>Power HP (kW)</th>
<th>Crankshaft speed rpm</th>
<th>Gal/hr (l/h)</th>
<th>Bhp.hr (kg/kW.hr)</th>
<th>Hp.hr/gal (kW/l)</th>
<th>Mean Atmospheric Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.55 (40.68)</td>
<td>2401</td>
<td>3.79 (14.36)</td>
<td>0.490 (0.298)</td>
<td>14.38</td>
<td>Air temperature 76°F (24°C)</td>
</tr>
<tr>
<td>55.94 (41.71)</td>
<td>2200</td>
<td>3.78 (14.32)</td>
<td>0.477 (0.290)</td>
<td>14.79</td>
<td>Relative humidity 12%</td>
</tr>
<tr>
<td>54.55 (40.68)</td>
<td>2401</td>
<td>3.79 (14.36)</td>
<td>0.490 (0.298)</td>
<td>14.38</td>
<td>Barometer 28.83&quot;Hg (97.63 kPa)</td>
</tr>
</tbody>
</table>

Max Torque 157 lb-ft. (213 Nm) at 1802 rpm
Max Torque Rise - 31.5%
Torque rise at 1899 rpm - 20%
Power increase at 2200 rpm - 2%

TRACTOR SOUND LEVEL WITHOUT CAB

Front Wheel Drive
Engaged dB(A) Disengaged dB(A)
At no load in Brange-speed setting 4.7 mph (7.5 km/h/engine 2600 rpm) 86.7 86.3
At no load in Brange-speed setting 4.7 mph (7.5 km/h/engine 1760 rpm) 83.3 82.5
Transport speed - no load - C range 87.4
Bystander in C range 79.9

TIRES AND WEIGHT

Rear Tires—No., size, ply & psi (kPa)
Two 17.5L-24; 8; 20
Front Tires—No., size, ply & psi (kPa)
Two 10-16.5; 6; 15
Height of Drawbar
16.5 in (420 mm)
Static Weight with operator— Rear
- 1675 lb (760 kg)
- 2960 lb (1340 kg)
Total 4035 lb (1830 kg)

Tested Without Ballast
Two 17.5L-24; 8; 20 (135)
Two 10-16.5; 6; 15 (105)
16.5 in (420 mm) 2960 lb (1340 kg)
1675 lb (760 kg)
4035 lb (1830 kg)
HYDRAULIC PERFORMANCE

CATEGORY: I
Quick Attach: None
OECD Static test
Maximum force exerted through whole range: 2523 lbs (11.2 kN)

i) Sustained pressure of the open relief valve: 2446 psi (169 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed: 11.3 GPM (42.8 l/min)
iii) Pump delivery rate at maximum hydraulic power: 10.8 GPM (40.9 l/min)
Delivery pressure: 2250 psi (155 bar)
Power: 14.2 HP (10.6 kW)

THREE POINT HITCH PERFORMANCE

Observed maximum pressure psi. (bar) 2516 (173)
Location: hydraulic service port
Hydraulic oil temperature: °F(°C) 158 (70)
Location: hydraulic sump
Category: II
Quick attach: None

SAE Static Test—System pressure 2165 psi (149 Bar)
Hitch point distance to ground level in. (mm) 8.1(205) 15.7(399) 20.0(508) 26.9(684) 32.1(816)
Lift force on frame lb (kN) (13.2) (13.6) (13.4) (11.6) (11.5)

OECD/SAE Test

<table>
<thead>
<tr>
<th>inch</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>21.9</td>
</tr>
<tr>
<td>B</td>
<td>11.4</td>
</tr>
<tr>
<td>C</td>
<td>13.7</td>
</tr>
<tr>
<td>D</td>
<td>12.7</td>
</tr>
<tr>
<td>E</td>
<td>11.7</td>
</tr>
<tr>
<td>F</td>
<td>5.2</td>
</tr>
<tr>
<td>G</td>
<td>23.1</td>
</tr>
<tr>
<td>H</td>
<td>0.2</td>
</tr>
<tr>
<td>I</td>
<td>12.6</td>
</tr>
<tr>
<td>J</td>
<td>17.9</td>
</tr>
<tr>
<td>K</td>
<td>15.8</td>
</tr>
<tr>
<td>L</td>
<td>32.9</td>
</tr>
<tr>
<td>M</td>
<td>20.1</td>
</tr>
<tr>
<td>N</td>
<td>27.5</td>
</tr>
<tr>
<td>O</td>
<td>8.1</td>
</tr>
<tr>
<td>P</td>
<td>36.0</td>
</tr>
<tr>
<td>Q</td>
<td>30.5</td>
</tr>
<tr>
<td>R</td>
<td>19.0</td>
</tr>
</tbody>
</table>

HITCH DIMENSIONS AS TESTED - NO LOAD

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE: The performance figures on this report apply to tractors with chassis S/N 650001 and higher.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor did not meet the manufacturer’s claim of implement pump flow of 12.0 GPM (45.3 l/min). For the maximum power tests, the fuel temperature at the injection pump inlet was maintained at 168°F (75°C).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1945, July 30, 2009.

Roger M. Hoy
Director

M.F. Kocher
V.I. Adamchuk
J.A. Smith
Board of Tractor Test Engineers
### Economy mode

540 PTO rpm @1735 engine rpm

<table>
<thead>
<tr>
<th>Power (HP)</th>
<th>Crank shaft speed rpm</th>
<th>Gal/hr (l/h)</th>
<th>lb/hr (kg/kW.h)</th>
<th>Hr/hr/gal (kW.h/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.81 (39.38)</td>
<td>1734</td>
<td>3.25 (12.30)</td>
<td>0.434 (0.264)</td>
<td>16.26 (3.20)</td>
</tr>
<tr>
<td>41.05 (30.61)</td>
<td>1739</td>
<td>2.55 (9.65)</td>
<td>0.457 (0.266)</td>
<td>16.12 (3.17)</td>
</tr>
<tr>
<td>27.26 (20.33)</td>
<td>1734</td>
<td>1.62 (6.15)</td>
<td>0.420 (0.255)</td>
<td>16.80 (3.31)</td>
</tr>
<tr>
<td>13.60 (10.14)</td>
<td>1736</td>
<td>0.84 (3.18)</td>
<td>0.435 (0.265)</td>
<td>16.20 (3.19)</td>
</tr>
<tr>
<td>1.36 (1.01)</td>
<td>1729</td>
<td>0.29 (1.10)</td>
<td>1.511 (1.10)</td>
<td>4.67 (0.92)</td>
</tr>
</tbody>
</table>

### Normal mode

540 PTO rpm @2397 engine rpm

<table>
<thead>
<tr>
<th>Power (HP)</th>
<th>Crank shaft speed rpm</th>
<th>Gal/hr (l/h)</th>
<th>lb/hr (kg/kW.h)</th>
<th>Hr/hr/gal (kW.h/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.29 (38.99)</td>
<td>2389</td>
<td>3.59 (13.60)</td>
<td>0.484 (0.295)</td>
<td>14.56 (2.87)</td>
</tr>
<tr>
<td>41.02 (30.59)</td>
<td>2407</td>
<td>2.88 (10.93)</td>
<td>0.496 (0.302)</td>
<td>14.22 (2.89)</td>
</tr>
<tr>
<td>27.18 (20.27)</td>
<td>2389</td>
<td>1.94 (7.34)</td>
<td>0.503 (0.306)</td>
<td>14.05 (2.76)</td>
</tr>
<tr>
<td>13.60 (10.14)</td>
<td>2400</td>
<td>1.24 (4.70)</td>
<td>0.644 (0.391)</td>
<td>10.96 (2.16)</td>
</tr>
<tr>
<td>1.45 (1.08)</td>
<td>2393</td>
<td>0.67 (2.53)</td>
<td>3.256 (1.980)</td>
<td>2.17 (0.43)</td>
</tr>
</tbody>
</table>

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**John Deere 4520 Diesel**

Institute of Agriculture and Natural Resources  
University of Nebraska–Lincoln