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Test 1662: John Deere 5400 Diesel 9-speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1662—SUMMARY 117

JOHN DEERE 5400 DIESEL

9 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
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MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—(PTO speed—546 rpm)					
60.67 (45.24)	2400	3.53 (13.36)	0.406 (0.247)	17.19 (3.39)	

Maximum Power (2 Hours)					
62.56 (46.65)	2249	3.50 (13.24)	0.391 (0.238)	17.89 (3.52)	

VARYING POWER AND FUEL CONSUMPTION

60.67 (45.24)	2400	3.53 (13.36)	0.406 (0.247)	17.19 (3.39)	Air temperature 76°F (24°C)
53.78 (40.10)	2505	3.31 (12.52)	0.430 (0.261)	16.27 (3.20)	
40.30 (30.05)	2505	2.66 (10.08)	0.462 (0.281)	15.14 (2.98)	Relative humidity 49%
27.37 (20.41)	2550	2.10 (7.96)	0.537 (0.327)	13.01 (2.56)	
13.82 (10.30)	2574	1.59 (6.01)	0.803 (0.489)	8.70 (1.71)	Barometer 29.11" Hg (98.58 kPa)
0.45 (0.34)	2596	1.03 (3.90)	16.019 (9.742)	0.44 (0.09)	

Maximum Torque 170 lb.-ft (230 Nm) at 1586 rpm

Maximum Torque Rise 27.8%

DRAWBAR PERFORMANCE

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)
Maximum Power—7th (III1) Gear									
52.61 (39.23)	2427 (10.79)	8.13 (13.08)	2398	4.52	0.470 (0.286)	14.87 (2.93)	182 (83)	62 (17)	28.85 (97.70)
75% of Pull at Maximum Power—7th (III1) Gear									
41.40 (30.87)	1813 (8.06)	8.57 (13.79)	2493	3.27	0.515 (0.313)	13.58 (2.68)	181 (83)	77 (25)	28.85 (97.70)
50% of Pull at Maximum Power—7th (III1) Gear									
28.35 (21.14)	1211 (5.38)	8.78 (14.13)	2528	2.19	0.605 (0.368)	11.54 (2.27)	178 (81)	77 (25)	28.85 (97.70)
75% of Pull at Reduced Engine Speed—8th (III2) Gear									
41.38 (30.86)	1818 (8.09)	8.54 (13.74)	1720	3.27	0.445 (0.271)	15.69 (3.09)	182 (83)	77 (25)	28.85 (97.70)
50% of Pull at Reduced Engine Speed—8th (III2) Gear									
28.35 (21.14)	1215 (5.40)	8.75 (14.09)	1745	2.26	0.483 (0.294)	14.48 (2.85)	178 (81)	77 (25)	28.85 (97.70)

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)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th (II1) Gear									
38.22 (28.50)	5197 (23.12)	2.76 (4.44)	2501	14.67	0.563 (0.342)	12.42 (2.45)	177 (81)	59 (15)	28.87 (97.77)
5th (II2) Gear									
49.71 (37.07)	4748 (21.12)	3.93 (6.32)	2400	12.44	0.498 (0.303)	14.02 (2.76)	181 (83)	59 (15)	28.87 (97.77)
6th (II3) Gear									
52.65 (39.26)	3745 (16.66)	5.27 (8.48)	2250	8.08	0.467 (0.284)	14.95 (2.94)	183 (84)	62 (17)	28.85 (97.70)
7th (III1) Gear									
54.33 (40.52)	2690 (11.97)	7.57 (12.19)	2248	5.10	0.457 (0.278)	15.29 (3.01)	183 (84)	62 (17)	28.85 (97.70)

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

Dates of Test: September 29 to October 9, 1992

Manufacturer: John Deere Commercial Products,
Inc., P.O. Box 15458, Augusta, Ga 30919-1458

FUEL OIL and TIME: Fuel No. 2 Diesel Cetane
No. 53.9 **Specific gravity converted to 60°/60°F**
(15°/15°C) 0.8392 **Fuel weight** 6.987 lbs/gal
(0.837 kg/l) **Oil SAE 15W40 API service classifi-**
cation SG/CE To motor 1.925 gal (7.286 l) **Drained**
from motor 1.826 gal (6.914 l) **Transmission and**
hydraulic lubricant John Deere Hy-Gard fluid
Front axle lubricant John Deere GL-5 Gear Lu-
bricant SAE 80W-90 **Total time engine was op-**
erated 18.5 hours.

ENGINE: Make John Deere Diesel **Type** three
cylinder vertical with turbocharger **Serial No.** *CD
3029T 105761* **Crankshaft** lengthwise **Rated rpm**
2400 **Bore and stroke** (as specified) 4.19" × 4.331"
(106.4 mm × 110.0 mm) **Compression ratio** 17.8
to 1 **Displacement** 179 cu in (2934 ml) **Starting**
system 12 volt **Lubrication** pressure **Air cleaner**
two paper elements **Oil filter** one full flow car-
tridge **Oil cooler** engine coolant heat exchanger
for crankcase oil **Fuel filter** one paper element and
sediment bowl **Muffler** underhood **Exhaust** ver-
tical **Cooling medium temperature control** one
thermostat

ENGINE OPERATING PARAMETERS: **Fuel**
rate 23.9-25.9 lb/hr (10.85-11.75 kg/hr) **High idle**
2550-2600 rpm **Turbo boost** nominal 8.7-10.2 psi
(60-70 kPa) as measured 9.0 psi (62 kPa)

CHASSIS: **Type** front wheel assist **Serial No.**
LV5400C-130144 **Tread width** rear 53.9" (1370
mm) to 71.7" (1820 mm) front 50.9" (1292 mm) to
79.0" (2007 mm) **Wheel base** 80.7" (2050 mm) **Hy-**
draulic control system direct engine drive **Trans-**
mission selective gear fixed ratio **Nominal travel**
speeds mph (km/h) first 1.35 (2.17) second 1.94
(3.13) third 2.65 (4.27) fourth 3.12 (5.02) fifth 4.50
(7.24) sixth 6.14 (9.88) seventh 8.56 (13.78) eighth
12.36 (19.89) ninth 16.86 (27.13) reverse 2.27
(3.65), 5.24 (8.43), 14.39 (23.15) **Clutch** single dry
disc operated by foot pedal **Brakes** wet single disc
hydraulically operated by two foot pedals which
can be locked together **Steering** hydrostatic **Power**
take-off 540 rpm at 2376 engine rpm **Unladen**
tractor mass 5118 lb (2321 kg).

REPAIRS AND ADJUSTMENTS: No repairs
or adjustments.

**DRAWBAR PERFORMANCE
(BALLASTED—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)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—6th (II3) Gear									
52.10 (38.85)	3489 (15.52)	5.60 (9.01)	2400	7.05	0.486 (0.296)	14.36 (2.83)	179 (82)	49 (9)	28.71 (97.22)
75% of Pull at Maximum Power—6th (II3) Gear									
41.35 (30.84)	2605 (11.59)	5.95 (9.58)	2499	5.13	0.533 (0.324)	13.11 (2.58)	179 (81)	60 (16)	28.68 (98.12)
50% of Pull at Maximum Power—6th (II3) Gear									
28.42 (21.19)	1737 (7.72)	6.14 (9.88)	2534	3.53	0.615 (0.374)	11.37 (2.24)	177 (81)	60 (16)	28.68 (97.12)
75% of Pull at Reduced Engine Speed—7th (III1) Gear									
41.34 (30.83)	2614 (11.63)	5.93 (9.54)	1784	5.07	0.445 (0.271)	15.69 (3.09)	179 (82)	60 (16)	28.68 (97.12)
50% of Pull at Reduced Engine Speed—7th (III1) Gear									
28.47 (21.23)	1741 (7.74)	6.13 (9.87)	1815	3.46	0.485 (0.295)	14.42 (2.84)	177 (80)	60 (16)	28.68 (97.12)

MAXIMUM POWER IN SELECTED GEARS

4th (II1) Gear									
42.12 (31.41)	5842 (25.98)	2.70 (4.35)	2490	14.88	0.546 (0.332)	12.80 (2.52)	178 (81)	50 (10)	28.83 (97.63)
5th (II2) Gear									
51.60 (38.48)	4920 (21.81)	3.95 (6.35)	2400	10.72	0.491 (0.299)	14.24 (2.80)	179 (82)	47 (8)	28.72 (97.26)
6th (II3) Gear									
52.10 (38.85)	3489 (15.52)	5.60 (9.01)	2400	7.05	0.486 (0.296)	14.36 (2.83)	179 (82)	49 (9)	28.71 (97.22)
7th (III1) Gear									
52.03 (38.80)	2443 (10.86)	7.99 (12.86)	2400	4.88	0.486 (0.296)	14.37 (2.83)	179 (82)	52 (11)	28.70 (97.19)

**DRAWBAR PERFORMANCE
(BALLASTED—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)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th (II1) Gear									
49.15 (36.65)	6895 (30.67)	2.67 (4.30)	2447	14.76	0.515 (0.313)	13.57 (2.67)	179 (81)	50 (10)	28.88 (97.80)
5th (II2) Gear									
52.84 (39.40)	4853 (21.58)	4.08 (6.57)	2395	7.89	0.479 (0.291)	14.59 (2.87)	179 (81)	46 (8)	28.72 (97.26)
6th (II3) Gear									
52.91 (39.45)	3467 (15.42)	5.72 (9.21)	2396	5.37	0.479 (0.291)	14.60 (2.88)	179 (82)	48 (9)	28.71 (97.22)
7th (III1) Gear									
52.71 (39.30)	2430 (10.81)	8.13 (13.09)	2399	3.70	0.481 (0.292)	14.53 (2.86)	179 (82)	50 (10)	28.70 (97.19)

TRACTOR SOUND LEVEL WITHOUT CAB

	dB(A)
At 75% of load in 5th (II2) gear—front drive engaged	92.5
Bystander in 9th (II3 gear)	81.0

TIRES AND WEIGHT

	With Ballast	Without Ballast
Rear Tires —No., size, ply & psi (kPa)	Two 16.9-30; 6; 16 (110)	Two 16.9-30; 6; 12 (85)
Ballast —Liquid (total)	1620 lb (735 kg)	None
—Cast Iron (total)	1102 lb (500 kg)	None
Front Tires —No., size, ply & psi (kPa)	Two 11.2-24; 6; 12 (85)	Two 11.2-24; 6; 12 (85)
Ballast —Liquid (total)	None	None
—Cast Iron (total)	None	None
Height of Drawbar	17.0 in (430 mm)	17.5 in (445 mm)
Static Weight with Operator —Rear	5840 lb (2649 kg)	3110 lb (1411 kg)
—Front	2166 lb (982 kg)	2174 lb (986 kg)
—Total	8006 lb (3631 kg)	5284 lb (2397 kg)

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. During steady state operation on the PTO dynamometer, the character of the fuel system causes momentary engine speed fluctuations of +/– 10 rpm. For the maximum power tests, the fuel temperature at the injection pump was maintained at 140° F (60° C). The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1662**, Summary 117, October 23, 1992.

LOUIS I. LEVITICUS

Engineer-in-Charge

L. L. BASHFORD

R. D. GRISSO

K. VON BARGEN

Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. (bar)	2830 (195)				
Location	remote outlet				
Hydraulic oil temperature °F(°C)	170 (77)				
Location	hydraulic sump				
Category	II				
Quick attach	none				

Hitch point distance to ground level in. (mm)	8.0 (203)	15.0 (381)	22.0 (559)	29.0 (737)	36.0 (914)
Lift force on frame lb.	4686	4713	4625	4178	3619
" " " " " (kN)	(20.8)	(21.0)	(20.6)	(18.6)	(16.1)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: none

Maximum Force Exerted Through Whole Range:

2905 lbs (12.9 kN)

i) Opening pressure of relief valve:

NA

Sustained pressure with relief valve open:

2840 psi (196 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed:

11.8 GPM (44.7 l/min)

iii) Pump delivery rate at maximum hydraulic power:

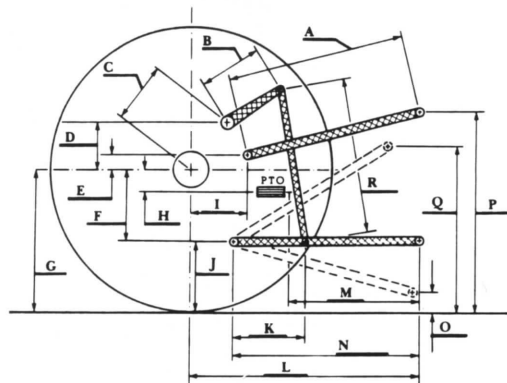
10.1 GPM (38.2 l/min)

Delivery pressure:

2470 psi (170 bar)

Power:

14.6 HP (10.9 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	24.1	613
B	11.0	280
C	14.0	356
D	12.2	311
E	11.2	284
F	6.5	166
G	27.4	695
H	0.2	4
I	15.1	384
J	20.8	529
K	16.7	424
L	39.2	996
M	22.4	570
N	32.9	836
O	8.0	203
P	44.9	1140
Q	34.0	864
R	20.8	527



John Deere 5400 Diesel