1-1-1992

Test 1661: John Deere 5300 Diesel 9-Speed

Nebraska Tractor Test Lab
University of Nebraska-Lincoln, tractortestlab@unl.edu

NEBRASKA OECD TRACTOR TEST 1661—SUMMARY 116
JOHN DEERE 5300 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
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—545 rpm)					
50.67 *(37.79)*	2401	3.09 *(11.70)*	0.426 *(0.259)*	16.39 *(3.23)*	
VARYING POWER AND FUEL CONSUMPTION					
50.67 *(37.79)*	2401	3.09 *(11.70)*	0.426 *(0.259)*	16.39 *(3.23)*	Air temperature
44.62 *(33.27)*	2493	2.79 *(10.56)*	0.437 *(0.266)*	15.99 *(3.15)*	76°F *(24°C)*
34.07 *(25.41)*	2526	2.23 *(8.45)*	0.458 *(0.279)*	15.26 *(3.01)*	Relative humidity
22.93 *(17.10)*	2550	1.80 *(6.83)*	0.550 *(0.334)*	12.71 *(2.50)*	39%
11.57 *(8.63)*	2573	1.33 *(5.04)*	0.804 *(0.489)*	8.69 *(1.71)*	Barometer
0.45 *(0.33)*	2590	0.90 *(3.41)*	14.070 *(8.559)*	0.50 *(0.10)*	29.17″ Hg *(98.80 kPa)*

Maximum Torque 133 lb.-ft *(180 Nm)* at 1490 rpm
Maximum Torque Rise 19.8%

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—5th (II2) Gear									
43.44 *(32.39)*	4170 *(18.55)*	3.91 *(6.29)*	2398	8.43	0.507 *(0.308)*	13.79 *(2.72)*	181 *(83)*	54 *(12)*	29.00 *(98.21)*
75% of Pull at Maximum Power—5th (II2) Gear									
35.13 *(26.20)*	3126 *(13.91)*	4.21 *(6.78)*	2509	5.50	0.512 *(0.312)*	13.64 *(2.69)*	179 *(82)*	60 *(16)*	29.01 *(98.24)*
50% of Pull at Maximum Power—5th (II2) Gear									
24.25 *(18.08)*	2086 *(9.28)*	4.36 *(7.02)*	2541	3.46	0.588 *(0.357)*	11.89 *(2.34)*	178 *(81)*	60 *(16)*	29.01 *(98.24)*
75% of Pull at Reduced Engine Speed—6th (II3) Gear									
35.11 *(26.18)*	3132 *(13.93)*	4.20 *(6.77)*	1835	5.50	0.481 *(0.292)*	14.54 *(2.86)*	180 *(82)*	60 *(16)*	29.01 *(98.24)*
50% of Pull at Reduced Engine Speed—6th (II3) Gear									
24.25 *(18.09)*	2092 *(9.30)*	4.35 *(7.00)*	1859	3.52	0.503 *(0.306)*	13.90 *(2.74)*	178 *(81)*	60 *(16)*	29.01 *(98.24)*

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									
36.34 *(27.10)*	5189 *(23.08)*	2.63 *(4.23)*	2496	14.58	0.550 *(0.334)*	12.71 *(2.50)*	179 *(81)*	54 *(12)*	29.00 *(98.21)*
5th (II2) Gear									
43.44 *(32.39)*	4170 *(18.55)*	3.91 *(6.29)*	2398	8.43	0.507 *(0.308)*	13.79 *(2.72)*	181 *(83)*	54 *(12)*	29.00 *(98.21)*
6th (II3) Gear									
43.49 *(32.43)*	2959 *(13.16)*	5.51 *(8.87)*	2395	5.01	0.504 *(0.307)*	13.86 *(2.73)*	182 *(83)*	54 *(12)*	29.00 *(98.21)*
7th (III1) Gear									
44.11 *(32.89)*	2114 *(9.40)*	7.82 *(12.59)*	2397	3.46	0.498 *(0.303)*	14.02 *(2.76)*	182 *(83)*	54 *(12)*	29.00 *(98.21)*

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

Dates of Test: September 22 to October 7, 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 classification** SG/CE **To motor** 2.052 gal *(7.768 l)* **Drained from motor** 1.899 gal *(7.189 l)* **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere GL-5 Gear Lubricant SAE 80W-90 **Total time engine was operated** 20.0 hours.

ENGINE: Make John Deere Diesel **Type** three cylinder vertical **Serial No.** *CD 3029D 105695* **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 cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** one paper element and sediment bowl **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** one thermostat

ENGINE OPERATING PARAMETERS: Fuel rate 21.2-22.9 lb/hr *(9.60-10.40 kg/hr)* **High idle** 2550-2600 rpm

CHASSIS: Type front wheel assist **Serial No.** *LV5300C-120221* **Tread width** rear 55.8″ *(1417 mm)* to 71.7″ *(1820 mm)* front 51.9″ *(1317 mm)* to 78.0″ *(1982 mm)* **Wheel base** 80.7″ *(2050 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph *(km/h)*** first 1.30 *(2.09)* second 1.88 *(3.02)* third 2.56 *(4.12)* fourth 3.01 *(4.84)* fifth 4.34 *(6.98)* sixth 5.92 *(9.52)* seventh 8.25 *(13.28)* eighth 11.92 *(19.18)* ninth 16.25 *(26.15)* reverse 2.19 *(3.52)*, 5.05 *(8.13)*, 13.87 *(22.32)* **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** 5008 lb *(2272 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)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Temp.°F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—6th (II3) Gear									
42.58	2937	5.44	2402	6.55	0.533	13.10	182	63	29.10
(31.75)	*(13.06)*	*(8.75)*			*(0.324)*	*(2.58)*	*(83)*	*(17)*	*(98.54)*
75% of Pull at Maximum Power—6th (II3) Gear									
34.01	2204	5.79	2508	4.80	0.535	13.05	180	66	29.05
(25.36)	*(9.80)*	*(9.31)*			*(0.326)*	*(2.57)*	*(82)*	*(19)*	*(98.37)*
50% of Pull at Maximum Power—6th (II3) Gear									
23.28	1468	5.95	2538	3.37	0.635	11.00	178	66	29.05
(17.36)	*(6.53)*	*(9.57)*			*(0.386)*	*(2.17)*	*(81)*	*(19)*	*(98.37)*
75% of Pull at Reduced Engine Speed—7th (III1) Gear									
33.99	2207	5.78	1794	4.68	0.499	14.01	182	66	29.05
(25.35)	*(9.82)*	*(9.30)*			*(0.303)*	*(2.76)*	*(83)*	*(19)*	*(98.37)*
50% of Pull at Reduced Engine Speed—7th (III1) Gear									
23.29	1458	5.99	1832	3.30	0.532	13.13	179	66	29.05
(17.36)	*(6.49)*	*(9.64)*			*(0.324)*	*(2.59)*	*(81)*	*(19)*	*(98.37)*

MAXIMUM POWER IN SELECTED GEARS

4th (II1) Gear									
35.03	5028	2.61	2498	14.84	0.548	12.75	179	60	29.09
(26.12)	*(22.37)*	*(4.20)*			*(0.333)*	*(2.51)*	*(82)*	*(16)*	*(98.51)*
5th (II2) Gear									
42.32	4144	3.83	2400	10.08	0.529	13.20	182	60	29.09
(31.56)	*(18.43)*	*(6.16)*			*(0.322)*	*(2.60)*	*(83)*	*(16)*	*(98.51)*
6th (II3) Gear									
42.58	2937	5.44	2402	6.55	0.533	13.10	182	63	29.10
(31.75)	*(13.06)*	*(8.75)*			*(0.324)*	*(2.58)*	*(83)*	*(17)*	*(98.54)*
7th (III1) Gear									
42.43	2053	7.75	2400	4.43	0.514	13.59	182	66	29.05
(31.64)	*(9.13)*	*(12.48)*			*(0.313)*	*(2.68)*	*(83)*	*(19)*	*(98.37)*

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)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Temp.°F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
3rd (I3) Gear									
37.10	6285	2.21	2483	14.95	0.558	12.52	179	59	29.09
(27.66)	*(27.96)*	*(3.56)*			*(0.340)*	*(2.47)*	*(82)*	*(15)*	*(98.51)*
4th (II1) Gear									
41.01	6063	2.54	2395	13.81	0.552	12.67	180	59	29.09
(30.58)	*(26.97)*	*(4.08)*			*(0.336)*	*(2.50)*	*(82)*	*(15)*	*(98.51)*
5th (II2) Gear									
43.36	4098	3.97	2398	6.84	0.506	13.80	181	60	29.09
(32.33)	*(18.23)*	*(6.39)*			*(0.308)*	*(2.72)*	*(83)*	*(16)*	*(98.51)*
6th (II3) Gear									
42.92	2901	5.55	2399	4.62	0.530	13.19	182	63	29.10
(32.01)	*(12.90)*	*(8.93)*			*(0.322)*	*(2.60)*	*(83)*	*(17)*	*(98.54)*
7th (III1) Gear									
42.61	2034	7.86	2399	2.99	0.515	13.56	182	63	29.10
(31.77)	*(9.05)*	*(12.64)*			*(0.313)*	*(2.67)*	*(83)*	*(17)*	*(98.54)*

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
At 75% of load in 5th (II2) gear—front drive engaged	93.0
Bystander in 9th (III3 gear)	84.5

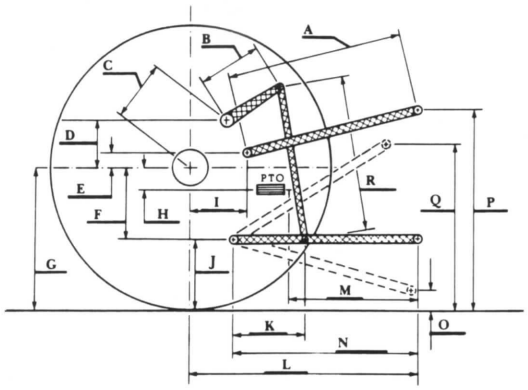
REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. During steady state operation on the PTO dynamometer, the character of the fuel system causes momentary engine speed fluctuations of +/− 10 rpm. For the maximum power tests, the fuel temperature at the injection pump was maintained at 144° F *(62° 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. **1661,** Summary 116, October 23, 1992.

LOUIS I. LEVITICUS
Engineer-in-Charge

L. L. BASHFORD
R. D. GRISSO
K. VON BARGEN
Board of Tractor Test Engineers

TIRES AND WEIGHT	With Ballast	Without Ballast
Rear Tires—No., size, ply & psi (kPa)	Two 16.9-28; 6; 14 *(95)*	Two 16.9-28; 6; 12 *(85)*
Ballast—Liquid (total)	1400 lb *(635 kg)*	None
—Cast Iron (total)	579 lb *(262 kg)*	None
Front Tires—No., size, ply & psi *(kPa)*	Two 9.5-24; 6; 12 *(85)*	Two 9.5-24; 6; 12 *(85)*
Ballast—Liquid (total)	None	None
—Cast Iron (total)	None	None
Height of Drawbar	16.5 in *(420 mm)*	16.5 in *(420 mm)*
Static Weight with Operator—Rear	5058 lb *(2294 kg)*	3055 lb *(1386 kg)*
—Front	2096 lb *(951 kg)*	2120 lb *(962 kg)*
—Total	7154 lb *(3245 kg)*	5175 lb *(2348 kg)*



HITCH DIMENSIONS AS TESTED—NO LOAD

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:	2820 psi	*(194 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	11.6 GPM	*(43.9 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	10.4 GPM	*(39.4 l/min)*
Delivery pressure:	2450 psi	*(169 bar)*
Power:	14.9 HP	*(11.1 kW)*

	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	26.4	*670*
H	0.2	*4*
I	15.1	*384*
J	19.8	*504*
K	16.7	*424*
L	39.2	*996*
M	22.4	*570*
N	32.9	*836*
O	7.0	*178*
P	43.9	*1114*
Q	33.0	*838*
R	20.8	*527*

John Deere 5300 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director