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January 1997

Test 1725: John Deere 7610 Powershift Diesel 19-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1725—SUMMARY 225

JOHN DEERE 7610 POWERSHIFT DIESEL

19 SPEED

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

Dates of Test: May 22 to June 18, 1997

Manufacturer: John Deere Tractor Works, P.O. Box
270, Waterloo, Iowa 50704

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—1006 rpm)					
115.96 (86.47)	2100	6.82 (25.82)	0.413 (0.251)	17.00 (3.35)	
Maximum Power (2 hours)					
117.27 (87.45)	1801	6.51 (24.66)	0.390 (0.237)	18.00 (3.55)	

VARYING POWER AND FUEL CONSUMPTION

115.96 (86.47)	2100	6.82 (25.82)	0.413 (0.251)	17.00 (3.35)	Air temperature
102.08 (76.12)	2170	6.33 (23.95)	0.435 (0.265)	16.13 (3.18)	75°F (24°C)
77.46 (57.76)	2202	5.26 (19.91)	0.476 (0.290)	14.73 (2.90)	Relative humidity
52.05 (38.81)	2233	4.28 (16.18)	0.576 (0.351)	12.17 (2.40)	47%
26.27 (19.59)	2257	3.12 (11.81)	0.834 (0.507)	8.42 (1.66)	Barometer
1.03 (0.77)	2267	2.05 (7.77)	13.915 (8.464)	0.50 (0.10)	28.86" Hg (97.73 kPa)

Maximum Torque 407 lb.-ft. (552 Nm) at 1247 rpm
Maximum Torque Rise 40.3%
Torque rise at 1699 engine rpm 24%

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)
Maximum Power 11th Gear									
96.26 (71.78)	6631 (29.49)	5.44 (8.76)	2099	2.24	0.490 (0.298)	14.33 (2.82)	190 (88)	76 (24)	28.87 (97.77)
75% of Pull at Maximum Power 11th Gear									
75.72 (56.47)	4967 (22.09)	5.72 (9.20)	2190	1.54	0.548 (0.333)	12.80 (2.52)	187 (86)	77 (25)	29.02 (98.27)
50% of Pull at Maximum Power 11th Gear									
51.48 (38.39)	3313 (14.73)	5.83 (9.38)	2221	1.26	0.651 (0.396)	10.78 (2.12)	184 (84)	78 (26)	28.98 (98.14)
75% of Pull at Reduced Engine Speed 13th									
75.86 (56.57)	4950 (22.02)	5.75 (9.25)	1665	1.75	0.480 (0.292)	14.63 (2.88)	187 (86)	77 (25)	29.00 (98.21)
50% of Pull at Reduced Engine Speed 13th									
51.60 (38.48)	3310 (14.72)	5.85 (9.41)	1685	1.26	0.548 (0.333)	12.80 (2.52)	178 (81)	79 (26)	28.96 (98.07)

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane**
No. 50.6 **Specific gravity converted to 60°/60° F**
(15°/15°C) 0.8427 **Fuel weight** 7.017 lbs/gal (0.841
kg/l) **Oil SAE 15W-40 API service classification**
CD, CE, CF-4 To motor 4.676 gal (17.702 l) **Drained**
from motor 4.581 gal (17.340 l) **Transmission**
and hydraulic lubricant John Deere Hy-Gard fluid
Front axle lubricant John Deere Hy-Gard and API
GL-5 Gear Lubricant Total time engine was
operated 25.5 hours.

ENGINE: Make John Deere **Diesel Type** six
cylinder vertical with turbocharger **Serial No.**
TO6068T705447 **Crankshaft** lengthwise **Rated**
engine speed 2100 **Bore and stroke** (as specified)
4.19" × 5.0" (106.5 mm × 127.0 mm) **Compression**
ratio 17.0 to 1 **Displacement** 414 cu in (6788 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 and
prestrainer **Fuel cooler** radiator for return fuel **Muffler**
underhood **Exhaust** vertical **Cooling medium**
temperature control two thermostats and variable
speed fan

ENGINE OPERATING PARAMETERS: Fuel
rate: 47.2-48.9 lb/h (21.4-22.2 kg/h) **High idle:** 2225-
2325 rpm **Turbo boost** nominal 7.5-11.9 psi (52-82
kPa) as measured 10.2 psi (70 kPa)

CHASSIS: Type front wheel assist **Serial No.**
RW7610P001326 **Tread width** rear 60.0" (1525
mm) to 100.3" (2548 mm) front 60.0" (1524 mm) to 88.0"
(2235 mm) **Wheel base** 110.2" (2800 mm) **Hydraulic**
control system direct engine drive **Transmission**
selective gear fixed ratio with full range operator
controlled powershift **Nominal travel speeds mph**
(km/h) first 0.94 (1.51) second 1.34 (2.16) third 1.68
(2.71) fourth 2.04 (3.29) fifth 2.35 (3.78) sixth 2.67
(4.30) seventh 3.08 (4.95) eighth 3.66 (5.89) ninth 4.22
(6.79) tenth 4.79 (7.70) eleventh 5.51 (8.87) twelfth 6.33
(10.18) thirteenth 7.29 (11.73) fourteenth 8.27 (13.32)
fifteenth 9.53 (15.34) sixteenth 10.68 (17.18) seventeenth
13.22 (21.28) eighteenth 18.46 (29.70) nineteenth
22.84 (36.75) reverse 1.51 (2.43), 2.16 (3.48), 3.28
(5.28), 3.78 (6.08), 4.29 (6.90), 4.94 (7.95), 9.57 (15.40)
Clutch multiple wet disc hydraulically actuated by foot
pedal **Brakes** wet multiple disc hydraulically actuated
by two foot pedals which can be locked together
Steering hydrostatic **Power take-off** 540 rpm at
2072 engine rpm and 1000 rpm at 2086 engine rpm
Unladen tractor mass 14790 lb (6709 kg)

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)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
5th Gear									
81.27 (60.61)	14475 (64.39)	2.11 (3.39)	2167	14.25	0.561 (0.341)	12.51 (2.46)	184 (84)	59 (15)	28.86 (97.73)
6th Gear									
91.17 (67.98)	13680 (60.85)	2.50 (4.02)	2130	8.64	0.518 (0.315)	13.54 (2.67)	186 (86)	64 (18)	28.86 (97.73)
7th Gear									
94.80 (70.69)	13249 (58.93)	2.68 (4.32)	1981	8.71	0.489 (0.297)	14.36 (2.83)	186 (86)	70 (21)	28.88 (97.80)
8th Gear									
94.54 (70.50)	11816 (52.56)	3.00 (4.83)	1800	5.40	0.478 (0.291)	14.69 (2.89)	189 (87)	70 (21)	28.87 (97.77)
9th Gear									
96.04 (71.62)	10276 (45.71)	3.50 (5.64)	1801	4.08	0.472 (0.287)	14.86 (2.93)	187 (86)	72 (22)	28.87 (97.77)
10th Gear									
96.58 (72.02)	9043 (40.23)	4.00 (6.45)	1800	3.45	0.466 (0.284)	15.05 (2.96)	190 (88)	75 (24)	28.87 (97.77)
11th Gear									
97.51 (72.72)	7846 (34.90)	4.66 (7.50)	1807	2.89	0.462 (0.281)	15.19 (2.99)	190 (88)	76 (24)	28.87 (97.77)
12th Gear									
95.73 (71.38)	6699 (29.80)	5.36 (8.62)	1801	2.41	0.473 (0.288)	14.84 (2.92)	189 (87)	77 (25)	28.87 (97.77)
13th Gear									
95.74 (71.39)	5808 (25.84)	6.18 (9.95)	1797	2.00	0.474 (0.288)	14.81 (2.92)	190 (88)	77 (25)	28.87 (97.77)
14th Gear									
95.19 (70.98)	5056 (22.49)	7.06 (11.36)	1803	1.59	0.478 (0.291)	14.69 (2.89)	191 (88)	77 (25)	28.87 (97.77)
15th Gear									
94.87 (70.75)	4368 (19.43)	8.15 (13.11)	1801	1.42	0.481 (0.292)	14.60 (2.88)	191 (88)	78 (26)	28.88 (97.80)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

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 return was maintained at 159° F (70°C). This tractor did not meet the manufacturer's claim of 72.0 dB(A) cab sound level. The performance results on this summary were taken from OECD tests conducted under the Code II Restricted Standard Test Code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1725**, Summary 225, July 11, 1997.

LOUIS I. LEVITICUS

Engineer-in-Charge

L.L. BASHFORD

R.D. GRISSO

M.F. KOCHER

Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At 75% load in 10th Gear	72.2	72.6
Bystander 19th Gear	81.8	—

TIRES, BALLAST AND WEIGHT

Rear Tires—No., size, ply & psi (kPa)

Front Tires—No., size, ply & psi (kPa)

Tested Without Ballast

Two 18.4R38; *, 13 (90)

Two 13.6R28; ***, 15 (105)

Height of Drawbar

21.0 in (535 mm)

Static Weight with Operator—Rear

9815 lb (4452 kg)

—Front

5150 lb (2336 kg)

—Total

14965 lb (6788 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)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power 11th Gear									
95.22 (71.01)	6583 (29.28)	5.42 (8.73)	2101	3.17	0.499 (0.304)	14.05 (2.77)	190 (88)	76 (24)	28.87 (97.77)
75% of Pull at Maximum Power 11th Gear									
75.18 (56.06)	4935 (21.95)	5.71 (9.20)	2191	2.03	0.550 (0.335)	12.76 (2.51)	186 (86)	77 (25)	29.01 (98.24)
50% of Pull at Maximum Power 11th Gear									
51.25 (38.22)	3296 (14.66)	5.83 (9.39)	2221	1.54	0.651 (0.396)	10.77 (2.12)	184 (84)	78 (26)	28.97 (98.10)
75% of Pull at Reduced Engine Speed 13th Gear									
75.34 (56.18)	4932 (21.94)	5.73 (9.22)	1661	2.10	0.479 (0.292)	14.64 (2.88)	187 (86)	77 (25)	29.00 (98.21)
50% of Pull at Reduced Engine Speed 13th Gear									
51.33 (38.28)	3296 (14.66)	5.84 (9.40)	1682	1.46	0.544 (0.331)	12.89 (2.54)	182 (83)	79 (26)	28.96 (98.07)
MAXIMUM POWER IN SELECTED GEARS									
7th Gear									
81.83 (61.02)	11162 (49.65)	2.75 (4.42)	2165	14.64	0.562 (0.342)	12.48 (2.46)	186 (86)	68 (20)	28.85 (97.70)
8th Gear									
91.68 (68.37)	9864 (43.88)	3.49 (5.61)	2101	6.36	0.514 (0.313)	13.66 (2.69)	189 (87)	69 (21)	28.86 (97.73)
9th Gear									
93.82 (69.96)	8622 (38.35)	4.08 (6.57)	2098	4.67	0.503 (0.306)	13.95 (2.75)	188 (87)	71 (22)	28.88 (97.80)
10th Gear									
94.67 (70.60)	7595 (33.78)	4.67 (7.52)	2098	3.65	0.503 (0.306)	13.95 (2.75)	187 (86)	73 (23)	28.87 (97.77)
11th Gear									
95.22 (71.01)	6583 (29.28)	5.42 (8.73)	2101	3.17	0.499 (0.304)	14.05 (2.77)	190 (88)	76 (24)	28.87 (97.77)
12th Gear									
93.07 (69.41)	5566 (24.76)	6.27 (10.09)	2104	2.69	0.512 (0.312)	13.70 (2.70)	189 (87)	77 (25)	28.87 (97.77)
13th Gear									
93.08 (69.41)	4828 (21.47)	7.23 (11.64)	2097	2.12	0.509 (0.309)	13.80 (2.72)	190 (88)	77 (25)	28.87 (97.77)
14th Gear									
91.69 (68.37)	4173 (18.56)	8.24 (13.26)	2099	1.87	0.517 (0.315)	13.57 (2.67)	188 (86)	77 (25)	28.87 (97.77)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III

Quick Attach: Walterscheid lower link ends

Maximum Force Exerted Through Whole Range:	10161 lbs	(45.2 kN)
i) Opening pressure of relief valve:	NA	
Sustained pressure with pump stalled:	2900 psi	(200 bar)
ii) Pump delivery rate at minimum pressure:	26.9 GPM	(101.8 l/min)
iii) Pump delivery rate at maximum		
hydraulic power:	24.6 GPM	(93.1 l/min)
Delivery pressure:	2540 psi	(175 bar)
Power:	36.5 HP	(27.2 kW)

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar)	2950 (203)
Location	lift cylinder
Hydraulic oil temperature °F (°C)	144 (62)
Location	hydraulic sump
Category	IIIN
Quick attach	No

SAE Static Test

system pressure — 2650 psi (182 bar)
lift cylinders 2 × 70 mm

Hitch point distance to ground level in (mm)	7.9 (201)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	9630	9558	9261	8595	7245
Lift force on frame (kN)	(42.8)	(42.5)	(41.2)	(38.2)	(32.2)

lift cylinders 1 × 70 mm and 1 × 80 mm

Hitch point distance to ground level (mm)	8.1 (206)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb	10953	10944	10629	9855	8397
Lift force one frame (kN)	(48.7)	(48.7)	(47.3)	(43.8)	(37.4)

lift cylinders 2 × 80 mm

Hitch point distance to ground level in. (mm)	7.7 (196)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	12177	12564	12177	11268	9549
Lift force on frame (kN)	(54.2)	(55.9)	(54.2)	(50.1)	(42.5)

ASAE Static Test

system pressure — 2860 psi (197 bar)
lift cylinders 2 × 70 mm

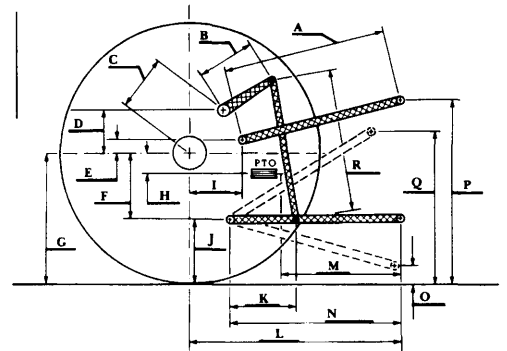
Hitch point distance to ground level in (mm)	7.9 (201)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	10514	10436	10111	9384	7910
Lift force on frame (kN)	(46.8)	(46.4)	(45.0)	(41.7)	(35.2)

lift cylinders 1 × 70 mm and 1 × 80 mm

Hitch point distance to ground level (mm)	8.1 (206)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb	11959	11949	11605	10760	9168
Lift force one frame (kN)	(53.2)	(53.2)	(51.6)	(47.9)	(40.8)

lift cylinders 2 × 80 mm

Hitch point distance to ground level in. (mm)	7.7 (196)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	13295	13718	13295	12303	10426
Lift force on frame (kN)	(59.1)	(61.0)	(59.1)	(54.7)	(46.4)



HITCH DIMENSIONS AS TESTED—NO LOAD

	OECD test		SAE test	
	inch	mm	inch	mm
A	27.2	692	26.6	676
B	14.8	375	14.8	375
C	24.5	623	24.5	623
D	23.1	588	23.1	588
E	11.1	283	7.5	190
F	10.8	275	10.8	275
G	35.6	905	34.2	870
H	4.1	105	4.1	105
I	19.8	504	19.8	504
J	24.8	630	23.4	595
K	24.1	612	23.1	587
L	47.5	1206	46.4	1179
M	23.1	586	22.0	559
N	39.8	1011	38.7	984
O	9.0	229	8.0	203
P	51.8	1315	45.4	1153
Q	38.8	984	36.8	933
R	38.1	968	35.9	911



JOHN DEERE 7610 POWERSHIFT DIESEL

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