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January 1997

Test 1738: John Deere 7210 Syncroplus Diesel 12-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1738—SUMMARY 238

JOHN DEERE 7210 SYNCROPLUS DIESEL

12 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—1002 rpm)					
95.74 (71.39)	2100	5.77 (21.85)	0.425 (0.258)	16.59 (3.27)	
Maximum Power (2 hours)					
97.46 (72.67)	1700	5.37 (20.35)	0.388 (0.236)	18.13 (3.57)	

VARYING POWER AND FUEL CONSUMPTION

95.74 (71.39)	2100	5.77 (21.85)	0.425 (0.258)	16.59 (3.27)	Air temperature
85.63 (63.85)	2205	5.45 (20.63)	0.448 (0.273)	15.71 (3.95)	76°F (25°C)
64.83 (48.34)	2232	4.60 (17.42)	0.500 (0.304)	14.09 (2.78)	Relative humidity
44.06 (32.86)	2544	3.79 (14.35)	0.606 (0.369)	11.62 (2.29)	77%
22.23 (16.58)	2278	2.81 (10.54)	0.889 (0.541)	7.91 (1.55)	Barometer
1.04 (0.78)	2299	1.96 (7.42)	13.214 (8.038)	0.53 (0.10)	28.59" Hg (96.82 kPa)

Maximum Torque 324 lb.-ft. (439 Nm) at 1202 rpm

Maximum Torque Rise 35.5%

Torque rise at 1700 engine rpm 26%

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—6th (C1) Gear									
83.56 (62.31)	6495 (28.89)	4.82 (7.76)	2103	3.35	0.482 (0.293)	14.62 (2.88)	196 (91)	57 (14)	29.21 (98.92)
75% of Pull at Maximum Power—6th (C1) Gear									
66.82 (49.83)	4877 (21.69)	5.14 (8.27)	2218	2.61	0.539 (0.328)	13.07 (2.58)	188 (87)	68 (20)	29.16 (98.75)
50% of Pull at Maximum Power—6th (C1) Gear									
45.52 (33.94)	3255 (14.48)	5.24 (8.44)	2243	1.52	0.636 (0.387)	11.08 (2.18)	186 (86)	70 (21)	29.14 (98.68)
75% of Pull at Reduced Engine Speed—8th (C2) Gear									
66.86 (49.86)	4854 (21.59)	5.17 (8.31)	1593	2.61	0.456 (0.277)	15.44 (3.04)	197 (91)	69 (21)	29.15 (98.71)
50% of Pull at Reduced Engine Speed—8th (C2) Gear									
45.49 (33.92)	3259 (14.49)	5.23 (8.42)	1601	1.60	0.517 (0.315)	13.62 (2.68)	184 (84)	70 (21)	29.14 (98.68)

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

Dates of Test: October 7 - 16, 1997

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

FUEL OIL and TIME: Fuel No. 2 Diesel Cetane
No. 53.9 Specific gravity converted to 60°/60°
F (15°/15°C) 0.8459 Fuel weight 7.043 lbs/gal
(0.844 kg/l) Oil SAE 15W-40 API service
classification CE/CG-4 To motor 4.871 gal
(18.440 l) Drained from motor 4.807 gal
(18.196 l) Transmission and hydraulic lubricant
John Deere Hy-Gard fluid Front axle lubricant
John Deere Hy-Gard fluid and API GL-5 Gear
Lubricant Total time engine was operated 24.5
hours.

ENGINE: Make John Deere Diesel Type six
cylinder vertical with turbocharger Serial No.
TO6068T720233 Crankshaft lengthwise Rated
engine speed 2100 Bore and stroke (as specified)
4.19" × 5.00" (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: 39.5-41.2 lb/h (17.9-18.7 kg/h) High idle:
2225-2325 rpm Turbo boost nominal 7.5-11.9 psi
(52-82 kPa) as measured 8.2 psi (57 kPa)

CHASSIS: Type front wheel assist Serial No.
RW7210S002213 Tread width rear 60.0" (1525
mm) to 88.0" (2235 mm) front 60.0" (1524 mm) to 88.0"
(2235 mm) Wheel base 103.3" (2625 mm) Hydraulic
control system direct engine drive Transmission
selective gear fixed ratio Nominal travel speeds
mph (km/h) first 1.43 (2.30) second 2.00 (3.22) third
2.64 (4.25) fourth 3.03 (4.87) fifth 4.24 (6.82) sixth 4.82
(7.75) seventh 5.59 (9.00) eighth 6.74 (10.85) ninth
8.90 (14.33) tenth 9.99 (16.08) eleventh 13.98 (22.50)
twelfth 18.46 (29.71) reverse 1.75 (2.81), 3.70 (5.96),
5.89 (9.48), 12.21 (19.65) 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 2080 engine rpm and
1000 rpm at 2093 engine rpm Unladen tractor
mass 12670 lb (5746 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)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
2nd (A2) Gear									
65.72 (49.00)	13271 (59.03)	1.86 (2.99)	2215	14.80	0.568 (0.346)	12.40 (2.44)	183 (84)	54 (12)	29.21 (98.92)
3rd (A3) Gear									
81.93 (61.10)	12298 (54.70)	2.50 (4.02)	2102	8.68	0.494 (0.300)	14.26 (2.81)	190 (88)	55 (13)	28.95 (98.04)
4th (B1) Gear									
84.17 (62.77)	10736 (47.75)	2.94 (4.73)	2098	6.05	0.482 (0.293)	14.61 (2.88)	190 (88)	56 (13)	28.95 (98.04)
5th (B2) Gear									
84.15 (62.75)	7499 (33.36)	4.21 (6.77)	2096	3.84	0.481 (0.292)	14.65 (2.89)	193 (89)	59 (15)	28.94 (98.00)
6th (C1) Gear									
83.56 (62.31)	6495 (28.89)	4.82 (7.76)	2103	3.35	0.482 (0.293)	14.62 (2.88)	196 (91)	57 (14)	29.21 (98.92)
7th (B3) Gear									
83.34 (62.14)	5561 (24.74)	5.62 (9.04)	2099	2.94	0.482 (0.293)	14.60 (2.88)	196 (91)	61 (16)	29.20 (98.88)
8th (C2) Gear									
81.22 (60.57)	4474 (19.90)	6.81 (10.96)	2097	2.36	0.496 (0.302)	14.19 (2.80)	194 (90)	62 (17)	29.19 (98.85)
9th (C3) Gear									
79.31 (59.14)	3277 (14.58)	9.08 (14.61)	2099	1.60	0.510 (0.310)	13.81 (2.72)	196 (91)	63 (17)	29.19 (98.85)

**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)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
2nd (A2) Gear									
65.39 (48.76)	13214 (58.78)	1.86 (2.99)	2214	14.86	0.571 (0.348)	12.33 (2.43)	184 (84)	54 (12)	29.21 (98.92)
3rd (A3) Gear									
82.00 (61.14)	12304 (54.73)	2.50 (4.02)	2105	8.75	0.493 (0.300)	14.28 (2.81)	189 (87)	55 (13)	28.95 (98.04)
4th (B1) Gear									
85.03 (63.41)	11856 (52.74)	2.69 (4.33)	1950	7.64	0.466 (0.284)	15.10 (2.98)	190 (88)	58 (14)	28.95 (98.04)
5th (B2) Gear									
85.65 (63.87)	9523 (42.36)	3.37 (5.43)	1710	5.35	0.438 (0.266)	16.08 (3.17)	197 (92)	60 (16)	29.21 (98.92)
6th (C1) Gear									
85.24 (63.56)	8297 (36.91)	3.85 (6.20)	1701	4.40	0.440 (0.268)	16.00 (3.15)	198 (92)	59 (15)	29.21 (98.92)
7th (B3) Gear									
86.53 (64.53)	7163 (31.86)	4.53 (7.29)	1709	3.76	0.432 (0.262)	16.32 (3.22)	197 (92)	61 (16)	29.19 (98.85)
8th (C2) Gear									
84.58 (63.07)	5769 (25.66)	5.50 (8.85)	1705	2.94	0.443 (0.269)	15.91 (3.13)	198 (92)	63 (17)	29.19 (98.85)
9th (C3) Gear									
83.41 (62.20)	4282 (19.05)	7.31 (11.76)	1701	2.28	0.448 (0.273)	15.72 (3.10)	195 (90)	65 (18)	29.18 (98.81)
10th (D1) Gear									
81.03 (60.43)	3696 (16.44)	8.22 (13.23)	1700	1.77	0.462 (0.281)	15.25 (3.00)	199 (93)	66 (19)	29.17 (98.78)

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 161°F (71°C). This tractor did not meet manufacturers 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. **1738**, Summary 238, November 11, 1997.

LOUIS I. LEVITICUS
Engineer-in-Charge

L.L. BASHFORD
R.D. GRISSO
M.F. KOCHER
Board of Tractor Test Engineers

**DRAWBAR PERFORMANCE
(UNBALLASTED—FRONT DRIVE DISENGAGED)
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)
Maximum Power—6th (C1) Gear									
84.72 (63.18)	6739 (29.98)	4.71 (7.59)	2095	3.75	0.475 (0.289)	14.82 (2.92)	196 (91)	58 (14)	29.21 (98.92)
75% of Pull at Maximum Power—6th (C1) Gear									
67.61 (50.42)	5019 (22.32)	5.05 (8.13)	2218	2.63	0.531 (0.323)	13.26 (2.61)	191 (88)	67 (19)	29.16 (98.75)
50% of Pull at Maximum Power—6th (C1) Gear									
46.15 (34.42)	3356 (14.93)	5.16 (8.30)	2244	1.72	0.622 (0.378)	11.33 (2.23)	187 (86)	70 (21)	29.14 (98.68)
75% of Pull at Reduced Engine Speed—8th (C2) Gear									
67.76 (50.53)	5007 (22.27)	5.08 (8.17)	1592	2.46	0.450 (0.274)	15.65 (3.08)	193 (89)	69 (21)	29.15 (98.71)
50% of Pull at Reduced Engine Speed—8th (C2) Gear									
46.11 (34.38)	3353 (14.91)	5.16 (8.30)	1605	1.64	0.498 (0.303)	14.13 (2.78)	186 (86)	70 (21)	29.14 (98.68)
MAXIMUM POWER IN SELECTED GEARS									
3rd (A3) Gear									
69.64 (51.93)	10876 (48.38)	2.40 (3.86)	2203	14.82	0.564 (0.343)	12.48 (2.46)	186 (85)	55 (13)	28.94 (98.00)
4th (B1) Gear									
78.98 (58.89)	10775 (47.93)	2.75 (4.42)	2104	11.09	0.513 (0.312)	13.72 (2.70)	188 (87)	59 (15)	28.94 (98.00)
5th (B2) Gear									
84.43 (62.96)	7645 (34.00)	4.14 (6.67)	2100	4.15	0.480 (0.292)	14.66 (2.89)	191 (88)	58 (14)	28.94 (98.00)
6th (C1) Gear									
84.72 (63.18)	6739 (29.98)	4.71 (7.59)	2095	3.75	0.475 (0.289)	14.82 (2.92)	196 (91)	58 (14)	29.21 (98.92)
7th (B3) Gear									
84.65 (63.12)	5747 (25.56)	5.52 (8.89)	2101	3.11	0.477 (0.290)	14.77 (2.91)	193 (89)	61 (16)	29.20 (98.88)
8th (C2) Gear									
83.63 (62.37)	4685 (20.84)	6.69 (10.77)	2097	2.38	0.482 (0.293)	14.62 (2.88)	194 (90)	62 (17)	29.19 (98.85)
9th (C3) Gear									
82.28 (61.36)	3464 (15.41)	8.91 (14.34)	2098	1.89	0.492 (0.299)	14.31 (2.82)	194 (90)	64 (18)	29.18 (98.81)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At 75% load in 7th (B3) Gear	73.7	73.6
Bystander in 12th (D3) Gear	81.4	—

TIRES, BALLAST 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 18.4R38: *, 16 (110)

Two 14.9R28;***, 16 (110)

21.5 in (545 mm)

8334 lb (3780 kg)

4500 lb (2041 kg)

12834 lb (5821 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: none

Maximum Force Exerted Through Whole Range: 6858 lbs (30.5 kN)
7790 lbs (34.6 kN) with 80 mm lift cylinders

- i) Opening pressure of relief valve: NA
- Sustained pressure of the open relief valve: 2920 psi (201 bar)
- ii) Pump delivery rate at minimum pressure: 27.3 GPM (103.3 l/min)
- iii) Pump delivery rate at maximum
 - hydraulic power: 25.5 GPM (96.5 l/min)
 - Delivery pressure: 2530 psi (174 bar)
 - Power: 37.6 HP (28.1 kW)

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. (bar) 2950 (203)
Location lift cylinders
Hydraulic oil temperature °F (°C) 140 (60)
Location hydraulic sump
Category II
Quick attach No

system pressure—2650 psi (182 bar)
lift cylinders—1 × 70 mm and 1 × 80 mm

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	10377	9369	8811	8217	7484
Lift force on frame (kN)	(46.2)	(41.7)	(39.2)	(36.6)	(33.3)

lift cylinders - 2 × 80 mm

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	11826	10773	10143	9405	8577
Lift force on frame (kN)	(52.6)	(47.9)	(45.1)	(41.8)	(38.2)

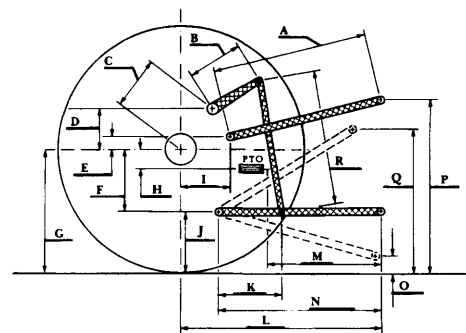
As per current SAE test procedures

system pressure 2860 psi (197 bar)
lift cylinders—1 × 70 mm and 1 × 80 mm

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	11178	10092	9491	8851	8061
Lift force on frame (kN)	(49.7)	(44.9)	(42.2)	(39.4)	(35.9)

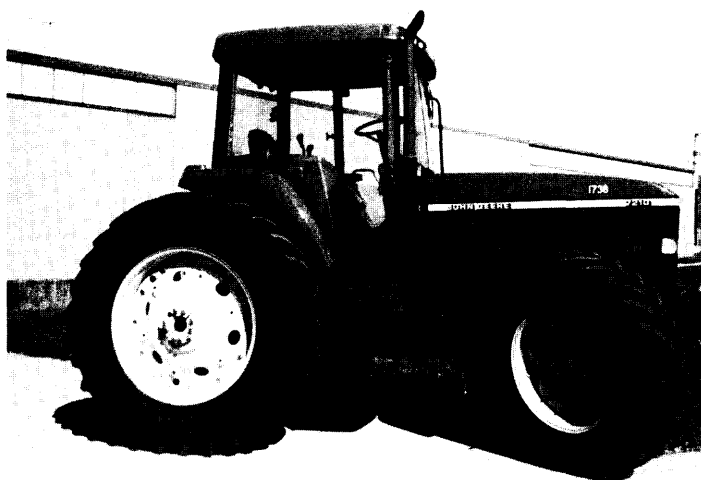
lift cylinders - 2 × 80 mm

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	12739	11605	10926	10131	9239
Lift force on frame (kN)	(56.7)	(51.6)	(48.6)	(45.1)	(41.1)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	27.8	705
B	15.7	400
C	21.8	554
D	20.6	523
E	4.9	125
F	9.8	250
G	32.3	820
H	3.1	80
I	18.0	456
J	22.5	570
K	21.1	537
L	44.2	1122
M	19.8	502
N	37.9	962
O	8.0	203
P	46.5	1180
Q	35.9	911
R	35.0	889



JOHN DEERE 7210 SYNCROPLUS DIESEL

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