

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1994

Test 1678: John Deere 7200 Syncroplus Diesel 12-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Nebraska Tractor Test Lab, "Test 1678: John Deere 7200 Syncroplus Diesel 12-Speed" (1994). *Nebraska Tractor Tests*. 1987.

<https://digitalcommons.unl.edu/tractormuseumlit/1987>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA OECD TRACTOR TEST 1678—SUMMARY 150

JOHN DEERE 7200 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—1003 rpm)					
94.02 (70.11)	2099	5.40 (20.44)	0.402 (0.244)	17.42 (3.43)	
Maximum Power (2 hours)					
95.06 (70.88)	1900	5.21 (19.71)	0.383 (0.233)	18.26 (3.60)	

VARYING POWER AND FUEL CONSUMPTION

94.02 (70.11)	2099	5.40 (20.44)	0.402 (0.244)	17.42 (3.43)	Air temperature
82.93 (61.84)	2184	5.02 (19.00)	0.423 (0.257)	16.52 (3.26)	80°F (27°C)
63.10 (47.06)	2209	4.29 (16.24)	0.475 (0.289)	14.71 (2.90)	Relative humidity
42.07 (31.37)	2227	3.39 (12.83)	0.563 (0.343)	12.41 (2.45)	65%
21.16 (15.78)	2245	2.53 (9.58)	0.836 (0.509)	8.36 (1.65)	Barometer
0.90 (0.67)	2260	1.72 (6.49)	13.266 (8.070)	0.53 (0.10)	29.06" Hg (98.44 kPa)

Maximum Torque 311 lb.-ft. (422 Nm) at 1400 rpm

Maximum Torque Rise 32.5%

Torque rise at 1700 engine rpm 20%

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—6th (C1) Gear									
82.70 (61.67)	6456 (28.72)	4.80 (7.73)	2101	3.97	0.457 (0.278)	15.31 (3.02)	196 (91)	70 (21)	28.73 (97.29)
75% of Pull at Maximum Power—6th (C1) Gear									
65.16 (48.59)	4838 (21.52)	5.05 (8.13)	2198	3.49	0.505 (0.307)	13.86 (2.73)	190 (88)	70 (21)	28.74 (97.32)
50% of Pull at Maximum Power—6th (C1) Gear									
44.39 (33.10)	3229 (14.36)	5.16 (8.30)	2221	2.33	0.603 (0.367)	11.60 (2.29)	186 (86)	70 (21)	28.74 (97.32)
75% of Pull at Reduced Engine Speed—8th (C2) Gear									
65.26 (48.67)	4843 (21.54)	5.05 (8.13)	1572	3.49	0.440 (0.268)	15.90 (3.13)	192 (89)	70 (21)	28.74 (97.32)
50% of Pull at Reduced Engine Speed—8th (C2) Gear									
44.34 (33.06)	3223 (14.34)	5.16 (8.30)	1589	2.41	0.491 (0.299)	14.23 (2.80)	184 (84)	70 (21)	28.74 (97.32)

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

Dates of Test: May 10 to June 1, 1994

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) 0.8400 Fuel weight 6.994 lbs/gal
(0.838 kg/l) Oil SAE 15W-40 API service
classification SG/CE To motor 4.251 gal
(16.093 l) Drained from motor 4.178 gal
(15.817 l) Transmission and hydraulic lubricant
John Deere Hy-Gard fluid Front axle lubricant
John Deere GL-5 Gear Lubricant Total time engine
was operated 20.0 hours.

ENGINE: Make John Deere Diesel Type six
cylinder vertical with turbocharger Serial No.
TO6059T431193 Crankshaft lengthwise Rated
engine speed 2100 Bore and stroke (as specified)
4.19"×4.331" (106.5 mm×110.0 mm) Compression
ratio 17.8 to 1 Displacement 359 cu in (5880 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 inlet fuel Muffler
underhood Exhaust vertical Cooling medium
temperature control two thermostats and variable
speed fan

ENGINE OPERATING PARAMETERS: Fuel
rate: 37.3-40.3 lb/h (16.9-18.3 kg/h) High idle:
2225-2325 rpm Turbo boost nominal 8.7-10.2 psi
(60-70 kPa) as measured 9.0 psi (65 kPa)

CHASSIS: Type front wheel assist Serial No.
RW7200S001437 Tread width rear 60.0" (1524
mm) to 100.3" (2548 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 12522 lb (5680 kg)

REPAIRS AND ADJUSTMENTS: No repairs or
adjustments

**DRAWBAR PERFORMANCE
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									
60.51 (45.13)	12254 (54.51)	1.85 (2.98)	2201	14.66	0.553 (0.336)	12.65 (2.49)	186 (85)	65 (18)	28.77 (97.43)
3rd (A3) Gear									
78.25 (58.35)	11598 (51.59)	2.53 (4.07)	2156	9.67	0.480 (0.292)	14.58 (2.87)	190 (88)	66 (19)	28.76 (97.39)
4th (B1) Gear									
81.84 (61.03)	10856 (48.29)	2.83 (4.55)	2060	8.14	0.460 (0.280)	15.22 (3.00)	193 (89)	69 (21)	28.74 (97.32)
5th (B2) Gear									
83.16 (62.01)	8260 (36.74)	3.78 (6.08)	1903	5.25	0.438 (0.267)	15.95 (3.14)	197 (92)	70 (21)	28.73 (97.29)
6th (C1) Gear									
83.22 (62.06)	7209 (32.07)	4.33 (6.97)	1903	4.45	0.439 (0.267)	15.93 (3.14)	197 (91)	70 (21)	28.73 (97.29)
7th (B3) Gear									
83.14 (62.00)	6171 (27.45)	5.05 (8.13)	1901	3.81	0.440 (0.268)	15.90 (3.13)	198 (92)	75 (24)	28.68 (97.12)
8th (C2) Gear									
79.95 (59.62)	4876 (21.69)	6.15 (9.90)	1905	2.99	0.452 (0.275)	15.46 (3.05)	197 (91)	71 (22)	28.71 (97.22)
9th (C3) Gear									
79.14 (59.02)	3642 (16.20)	8.15 (13.11)	1903	2.50	0.452 (0.275)	15.46 (3.05)	196 (91)	71 (22)	28.73 (97.29)

**DRAWBAR PERFORMANCE AT 2100 RPM (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)
3rd (A3) Gear									
76.19 (56.81)	12039 (53.55)	2.37 (3.82)	2130	14.34	0.499 (0.304)	14.01 (2.76)	190 (88)	66 (19)	28.77 (97.43)
4th (B1) Gear									
82.36 (61.42)	10678 (47.50)	2.89 (4.66)	2103	7.84	0.461 (0.280)	15.18 (2.99)	192 (89)	68 (20)	28.74 (97.32)
5th (B2) Gear									
83.04 (61.92)	7419 (33.00)	4.20 (6.75)	2101	4.45	0.457 (0.278)	15.32 (3.02)	196 (91)	70 (21)	28.73 (97.29)
6th (C1) Gear									
82.70 (61.67)	6456 (28.72)	4.80 (7.73)	2101	3.97	0.457 (0.278)	15.31 (3.02)	196 (91)	70 (21)	28.73 (97.29)
7th (B3) Gear									
82.65 (61.63)	5529 (24.59)	5.61 (9.02)	2100	3.49	0.460 (0.280)	15.21 (3.00)	196 (91)	74 (23)	28.69 (97.16)
8th (C2) Gear									
79.64 (59.39)	4392 (19.54)	6.80 (10.94)	2099	2.83	0.472 (0.287)	14.82 (2.92)	196 (91)	71 (22)	28.72 (97.26)
9th (C3) Gear									
78.94 (58.87)	3293 (14.65)	8.99 (14.47)	2096	2.41	0.476 (0.290)	14.69 (2.89)	194 (90)	71 (22)	28.73 (97.29)

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 156° F (69°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. **1678**, Summary 150, July 21, 1994.

LOUIS I. LEVITICUS

Engineer-in-Charge

R.D. GRISSO

M.F. KOCHER

K. VON BARGEN

Board of Tractor Test Engineers

DRAWBAR PERFORMANCE (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—7th (B3) Gear									
83.81 (62.50)	5708 (25.39)	5.51 (8.86)	2099	3.57	0.454 (0.276)	15.40 (3.03)	197 (91)	72 (22)	28.70 (97.19)
75% of Pull at Maximum Power—7th (B3) Gear									
66.36 (49.48)	4274 (19.01)	5.82 (9.37)	2198	2.68	0.505 (0.307)	13.85 (2.73)	192 (89)	76 (24)	28.67 (97.09)
50% of Pull at Maximum Power—7th (B3) Gear									
45.01 (33.57)	28.54 (12.70)	5.91 (9.52)	2220	2.11	0.592 (0.360)	11.82 (2.33)	186 (86)	76 (24)	28.67 (97.09)
75% of Pull at Reduced Engine Speed—8th (C2) Gear									
66.11 (49.30)	4272 (19.00)	5.80 (9.34)	1825	3.09	0.456 (0.277)	15.35 (3.02)	190 (88)	76 (24)	28.67 (97.09)
50% of Pull at Reduced Engine Speed—8th (C2) Gear									
44.87 (33.46)	2847 (12.66)	5.91 (9.51)	1840	2.02	0.512 (0.311)	13.66 (2.69)	185 (85)	76 (24)	28.67 (97.09)

MAXIMUM POWER IN SELECTED GEARS

4th (B1) Gear									
70.38 (52.48)	9612 (42.75)	2.75 (4.42)	2181	14.20	0.519 (0.316)	13.47 (2.65)	190 (88)	67 (19)	28.75 (97.36)
5th (B2) Gear									
83.21 (62.05)	7603 (33.82)	4.10 (6.60)	2103	5.38	0.455 (0.277)	15.36 (3.02)	195 (91)	70 (21)	28.73 (97.29)
6th (C1) Gear									
83.31 (62.12)	6628 (29.48)	4.71 (7.59)	2102	4.37	0.454 (0.276)	15.41 (3.04)	197 (92)	70 (21)	28.73 (97.29)
7th (B3) Gear									
83.81 (62.50)	5708 (25.39)	5.51 (8.86)	2099	3.57	0.454 (0.276)	15.40 (3.03)	197 (91)	72 (22)	28.70 (97.19)
8th (C2) Gear									
81.41 (60.71)	4557 (20.27)	6.70 (10.78)	2101	2.76	0.463 (0.282)	15.10 (2.97)	196 (91)	71 (22)	28.72 (97.26)
9th (C3) Gear									
80.07 (59.71)	3374 (15.01)	8.90 (14.32)	2099	2.11	0.469 (0.285)	14.92 (2.94)	197 (92)	71 (22)	28.73 (97.29)

TRACTOR SOUND LEVEL WITH CAB

	Front Wheel Drive Disengaged dB(A)	Engaged dB(A)
At 75% load in 7th (B3) Gear	73.0	73.5
Bystander in 12th (D3) Gear	82.5	—

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 13.6R28; ***, 24 (165)

21.5 in (545 mm)

8336 lb (3781 kg)

4352 lb (1974 kg)

12688 lb (5755 kg)

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

With 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)

With 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)

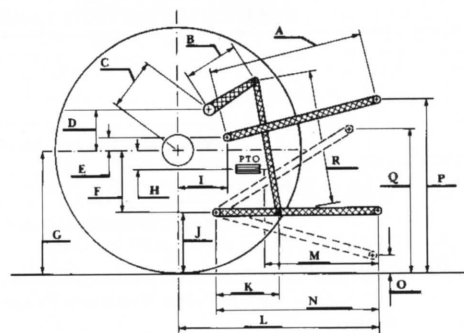
THREE POINT HITCH PERFORMANCE (OECD Static Test)

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 with pump stalled: 2880 psi (199 bar)
- ii) Pump delivery rate at minimum pressure and rated engine speed: 25.9 GPM (98.0 l/min)
- iii) Pump delivery rate at maximum hydraulic power: 23.7 GPM (89.7 l/min)
- Delivery pressure: 2640 psi (182 bar)
- Power: 36.5 HP (27.2 kW)



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 7200 SYNCROPLUS DIESEL

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