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January 1994

Test 1680: John Deere 7400 Syncroplus Diesel 12-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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NEBRASKA OECD TRACTOR TEST 1680—SUMMARY 152
JOHN DEERE 7400 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)					
102.14 (76.16)	2099	5.88 (22.24)	0.402 (0.245)	17.38 (3.42)	
Maximum Power (2 hours)					
104.92 (78.24)	1900	5.67 (21.47)	0.378 (0.230)	18.50 (3.64)	

VARYING POWER AND FUEL CONSUMPTION

102.14 (76.16)	2099	5.88 (22.24)	0.402 (0.245)	17.38 (3.42)	Air temperature
89.20 (66.52)	2162	5.40 (20.46)	0.424 (0.258)	16.50 (3.25)	75°F (24°C)
67.91 (50.64)	2195	4.59 (17.37)	0.473 (0.288)	14.80 (2.91)	Relative humidity
45.66 (34.05)	2221	3.69 (13.96)	0.565 (0.344)	12.38 (2.44)	62%
23.11 (17.23)	2235	2.79 (10.55)	0.844 (0.513)	8.29 (1.63)	Barometer
0.82 (0.61)	2251	1.89 (7.14)	16.112 (9.801)	0.43 (0.09)	28.79" Hg (97.48 kPa)

Maximum Torque 346 lb.-ft. (469 Nm) at 1201 rpm
Maximum Torque Rise 35.6%
Torque rise at 1702 engine rpm 22%

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									
90.35 (67.37)	7076 (31.47)	4.79 (7.71)	2101	4.32	0.453 (0.276)	15.43 (3.04)	200 (93)	69 (21)	28.93 (97.97)
75% of Pull at Maximum Power—6th (C1) Gear									
70.63 (52.67)	5293 (23.54)	5.00 (8.05)	2174	3.35	0.501 (0.305)	13.95 (2.75)	196 (91)	72 (22)	28.94 (98.00)
50% of Pull at Maximum Power—6th (C1) Gear									
48.12 (35.88)	3522 (15.66)	5.12 (8.25)	2205	2.44	0.604 (0.368)	11.57 (2.28)	189 (87)	72 (22)	28.94 (98.00)
75% of Pull at Reduced Engine Speed—8th (C2) Gear									
70.76 (52.77)	5291 (23.53)	5.02 (8.07)	1557	3.43	0.428 (0.260)	16.34 (3.22)	197 (91)	72 (22)	28.94 (98.00)
50% of Pull at Reduced Engine Speed—8th (C2) Gear									
48.12 (35.88)	3515 (15.63)	5.13 (8.26)	1579	2.52	0.477 (0.290)	14.67 (2.89)	186 (86)	72 (22)	28.94 (98.00)

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

Dates of Test: May 23 to June 2, 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 4.104 gal
(15.535 l) Drained from motor 3.989 gal
(15.099 l) Transmission and hydraulic lubricant
John Deere Hy-Gard fluid Front axle lubricant
John Deere GL-5 Gear Lubricant Total time engine
was operated 21.0 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" × 5.0" (106.5 mm × 127.0 mm) Compression
ratio 17.8 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 inlet fuel Muffler
underhood Exhaust vertical Cooling medium
temperature control two thermostats and variable
speed fan

ENGINE OPERATING PARAMETERS: Fuel
rate: 40.1-43.2 lb/h (18.2-19.6 kg/h) High idle:
2225-2325 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.
RW7400S001684 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 12666 lb (5745 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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
81.28 (60.61)	12739 (56.67)	2.39 (3.85)	2131	13.98	3rd (A3) Gear 0.502 (0.305)	13.94 (2.75)	192 (89)	60 (16)	28.90 (97.87)
88.67 (66.12)	11562 (51.43)	2.88 (4.63)	2100	8.32	4th (B1) Gear 0.463 (0.281)	15.12 (2.98)	196 (91)	64 (18)	28.91 (97.90)
91.70 (68.38)	9157 (40.73)	3.76 (6.04)	1904	5.82	5th (B2) Gear 0.430 (0.261)	16.27 (3.20)	201 (94)	68 (20)	28.93 (97.97)
91.78 (68.44)	7988 (35.57)	4.30 (6.93)	1901	4.88	6th (C1) Gear 0.430 (0.261)	16.27 (3.21)	200 (93)	69 (21)	28.94 (98.00)
92.68 (69.11)	6897 (30.68)	5.04 (8.11)	1902	4.16	7th (B3) Gear 0.427 (0.260)	16.37 (3.23)	201 (94)	69 (21)	28.93 (97.97)
91.25 (68.05)	5606 (24.93)	6.10 (9.82)	1897	3.51	8th (C2) Gear 0.434 (0.264)	16.11 (3.17)	201 (94)	70 (21)	28.93 (97.97)
89.61 (66.82)	4137 (18.40)	8.12 (13.07)	1898	2.77	9th (C3) Gear 0.442 (0.269)	15.83 (3.12)	201 (94)	71 (22)	28.94 (98.00)

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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
80.09 (59.73)	12617 (56.12)	2.38 (3.83)	2136	14.56	3rd (A3) Gear 0.507 (0.308)	13.80 (2.72)	194 (90)	60 (16)	28.90 (97.87)
88.55 (66.03)	11528 (51.28)	2.88 (4.63)	2101	8.24	4th (B1) Gear 0.463 (0.281)	15.12 (2.98)	196 (91)	64 (18)	28.91 (97.90)
90.47 (67.46)	8119 (36.12)	4.18 (6.72)	2100	4.96	5th (B2) Gear 0.454 (0.276)	15.41 (3.04)	200 (93)	66 (19)	28.92 (97.93)
90.35 (67.37)	7076 (31.47)	4.79 (7.71)	2101	4.32	6th (C1) Gear 0.453 (0.276)	15.43 (3.04)	200 (93)	69 (21)	28.93 (97.97)
90.52 (67.50)	6074 (27.02)	5.59 (8.99)	2101	3.67	7th (B3) Gear 0.454 (0.276)	15.39 (3.03)	199 (93)	69 (21)	28.93 (97.97)
88.54 (66.02)	4894 (21.77)	6.78 (10.92)	2100	3.10	8th (C2) Gear 0.464 (0.282)	15.07 (2.97)	201 (94)	70 (21)	28.93 (97.97)
86.55 (64.54)	3599 (16.01)	9.02 (14.52)	2099	2.44	9th (C3) Gear 0.474 (0.288)	14.76 (2.91)	201 (94)	71 (22)	28.94 (98.00)

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 152° F (67°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. 1680, Summary 152, 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		Temp.°F (°C)		Barom. inch Hg (kPa)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med	Air dry bulb	
Maximum Power—7th (B3) Gear									
91.09 (67.93)	6221 (27.67)	5.49 (8.84)	2099	3.93	0.451 (0.274)	15.51 (3.05)	200 (93)	69 (21)	28.93 (97.97)
75% of Pull at Maximum Power—7th (B3) Gear									
71.45 (53.28)	4671 (20.78)	5.74 (9.23)	2170	2.80	0.497 (0.302)	14.08 (2.77)	197 (92)	72 (22)	28.94 (98.00)
50% of Pull at Maximum Power—7th (B3) Gear									
48.69 (36.30)	3111 (13.84)	5.87 (9.44)	2201	2.06	0.594 (0.361)	11.78 (2.32)	190 (88)	72 (22)	28.94 (98.00)
75% of Pull at Reduced Engine Speed—9th (C3) Gear									
71.37 (53.22)	4670 (20.77)	5.73 (9.22)	1363	2.88	0.412 (0.250)	16.99 (3.35)	201 (94)	72 (22)	28.94 (98.00)
50% of Pull at Reduced Engine Speed—9th (C3) Gear									
48.61 (36.24)	3114 (13.85)	5.85 (9.42)	1380	2.06	0.453 (0.275)	15.45 (3.04)	186 (86)	72 (22)	28.94 (98.00)
MAXIMUM POWER IN SELECTED GEARS									
4th (B1) Gear									
73.35 (54.70)	10144 (45.12)	2.71 (4.36)	2157	14.61	0.527 (0.320)	13.28 (2.62)	193 (89)	62 (17)	28.91 (97.90)
5th (B2) Gear									
89.96 (67.08)	8271 (36.79)	4.08 (6.56)	2101	5.87	0.455 (0.277)	15.36 (3.03)	200 (93)	67 (19)	28.92 (97.93)
6th (C1) Gear									
90.21 (67.27)	7202 (32.04)	4.70 (7.56)	2102	4.71	0.454 (0.276)	15.41 (3.04)	201 (94)	69 (21)	28.94 (98.00)
7th (B3) Gear									
91.09 (67.93)	6221 (27.67)	5.49 (8.84)	2099	3.93	0.451 (0.274)	15.51 (3.05)	200 (93)	69 (21)	28.93 (97.97)
8th (C2) Gear									
90.12 (67.20)	5064 (22.53)	6.67 (10.74)	2099	3.04	0.456 (0.277)	15.34 (3.02)	200 (93)	70 (21)	28.93 (97.97)
9th (C3) Gear									
88.81 (66.23)	3755 (16.70)	8.87 (14.27)	2097	2.47	0.462 (0.281)	15.14 (2.98)	201 (94)	71 (22)	28.94 (98.00)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At 75% load in 7th (B3) Gear	73.0	73.0
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)
8400 lb (3810 kg)
4430 lb (2009 kg)
12830 lb (5819 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

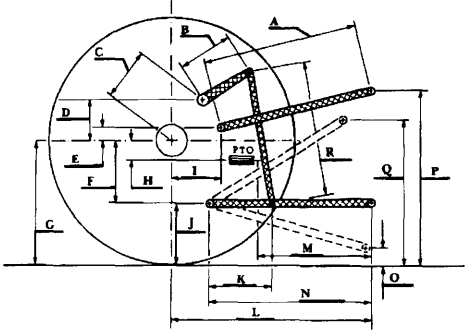
Hitch point distance to ground level in. (mm)	8.0 (203)	15.0 (381)	22.0 (559)	29.0 (737)	36.0 (914)
Lift force on frame lb	11178	10092	9491	8851	8061
Lift force on frame (kN)	(49.7)	(44.9)	(42.2)	(39.4)	(35.9)

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:	25.8 GPM	(97.7 l/min)		
iii) Pump delivery rate at maximum hydraulic power:	23.6 GPM	(89.3 l/min)		
Delivery pressure:	2550 psi	(176 bar)		
Power:	35.1 HP	(26.2 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 7400 SYNCROPLUS DIESEL

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