

# NEBRASKA OECD TRACTOR TEST 2084A—SUMMARY 933A

## JOHN DEERE 7270R DIESEL

### ALSO JOHN DEERE 7R 270 DIESEL

### e23 TRANSMISSION

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

**Dates of tests:** April 18 - 23, 2014

**Manufacturer:** John Deere Tractor Works, 3500 East Donald Street, P.O. Box 270, Waterloo Ia, 50704-0270

**CONSUMABLE Fluids, OIL and TIME: Fuel** No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8410 **Fuel weight** 7.002 lbs/gal (0.839 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil** SAE 15W-40 **API service classification** CJ-4 **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere Hy-Gard fluid **Total time engine was operated:** 23.0 hours

**ENGINE: Make** John Deere **Diesel Type** six cylinder vertical with two turbochargers, air to air aftercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.\*** PE6068U000359\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.19" x 5.00" (106.5 mm x 127.0 mm) **Compression ratio** 16.0 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 pump return fuel **Exhaust** regenerative particulate filter integrated within a vertical muffler **Cooling medium temperature control** 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 87.6 - 95.0 lb/h (39.7 - 43.1 kg/h) **High idle:** 2150 - 2250 rpm **Turbo boost:** nominal 32.6 - 35.5 psi (225 - 245 kPa) as measured 34.4 psi (237 kPa)

**CHASSIS: Type** front wheel assist with duals **Serial No.\*** 1RW7270RLES081008\* **Tread width** rear 60.0" (1524 mm) to 128.9" (3272 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) **Wheelbase** 115.2" (2925 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled power shift **Nominal travel speeds mph (km/h)** first 1.43 (2.30) second 1.65 (2.66) third 1.91 (3.07) fourth 2.20 (3.54) fifth 2.54 (4.08) sixth 2.93 (4.71) seventh 3.35 (5.39) eighth 3.87 (6.22) ninth 4.42 (7.12) tenth 5.11 (8.22) eleventh 5.90 (9.49) twelfth 6.79 (10.92) thirteenth 7.84 (12.61) fourteenth 8.97 (14.44) fifteenth 10.36 (16.68) sixteenth 12.04 (19.37) seventeenth 13.90 (22.37) eighteenth 16.05 (25.83) nineteenth 18.54 (29.84) twentieth 21.33 (34.33) twenty-first 24.64 (39.65) twenty-second 26.10 (42.00) twenty-third 26.10 (42.00) electronically limited

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption		Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)	
<b>Rated Engine Speed—(PTO speed—1077 rpm)</b>						
227.46 (169.62)	2100	13.25 (50.17)	0.408 (0.248)	17.16 (3.38)	0.40 (1.52)	Fuel used during active exhaust regeneration-1.68 gal (6.36 l) (see note 1, p.2)
<b>Standard Power Take-off Speed (1000 rpm)</b>						
247.52 (184.58)	1950	14.22 (53.84)	0.402 (0.245)	17.40 (3.43)	0.35 (1.33)	
<b>Maximum Power (1 hour)</b>						
256.06 (190.94)	1800	14.42 (54.60)	0.394 (0.240)	17.75 (3.50)	0.32 (1.22)	

#### VARYING POWER AND FUEL CONSUMPTION

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	D.E.F. Consumption Hp.hr/gal (kW.h/l)	Other
227.46 (169.62)	2100	13.25 (50.17)	0.408 (0.248)	17.16 (3.38)	0.40 (1.52) Air temperature
198.12 (147.74)	2153	11.82 (44.76)	0.418 (0.254)	16.75 (3.30)	0.46 (1.73) 74°F (23°C)
149.22 (111.27)	2164	9.24 (34.97)	0.434 (0.264)	16.15 (3.18)	0.36 (1.36) Relative humidity
99.93 (74.52)	2174	6.90 (26.12)	0.484 (0.294)	14.48 (2.85)	0.25 (0.96) 28%
50.25 (37.47)	2185	4.85 (18.34)	0.675 (0.411)	10.37 (2.04)	0.10 (0.37) Barometer
0.57 (0.43)	2194	2.63 (9.95)	32.108 (19.531)	0.22 (0.04)	0.15 (0.57) 28.92" Hg (97.93 kPa)

Maximum torque - 822 lb.-ft. (1114 Nm) at 1500 rpm  
 Maximum torque rise - 44.3%  
 Torque rise at 1680 engine rpm - 39%  
 Power increase at 1800 engine rpm - 12.5%

#### 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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Power at Rated Engine Speed—9th Gear- Manual mode</b>									
203.00 (151.38)	17921 (79.72)	4.25 (6.84)	2101	4.2	0.455 (0.277)	15.39 (3.03)	219 (104)	59 (15)	28.89 (97.83)
<b>75% of Pull at Rated Engine Speed—9th Gear- Manual mode</b>									
158.57 (118.25)	13409 (59.65)	4.43 (7.13)	2158	2.7	0.461 (0.281)	15.18 (2.99)	217 (103)	61 (16)	28.89 (97.83)
<b>50% of Pull at Rated Engine Speed—9th Gear- Manual mode</b>									
107.64 (80.26)	8969 (39.89)	4.50 (7.24)	2169	1.7	0.501 (0.305)	13.97 (2.75)	216 (102)	63 (17)	28.88 (97.80)
<b>75% of Pull at Reduced Engine Speed—4.6 mph (7.4 km/h)- Auto mode</b>									
159.21 (118.72)	13402 (59.61)	4.46 (7.17)	1413	2.7	0.439 (0.267)	15.93 (3.14)	216 (102)	62 (17)	28.89 (97.83)
<b>50% of Pull at Reduced Engine Speed—4.6 mph (7.4 km/h)- Auto mode</b>									
107.33 (80.03)	8955 (39.83)	4.49 (7.23)	1222	1.8	0.443 (0.269)	15.80 (3.11)	215 (101)	64 (18)	28.86 (97.73)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED**  
**MANUAL MODE - 2100 ENGINE RPM**  
**DRAWBAR 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)
7th Gear									
180.31 (134.46)	23264 (103.48)	2.91 (4.68)	2121	14.4	0.500 (0.304)	14.00 (2.76)	218 (103)	50 (10)	28.89 (97.89)
8th Gear									
200.10 (149.21)	20582 (91.55)	3.65 (5.87)	2099	6.0	0.460 (0.280)	15.23 (3.00)	218 (103)	55 (13)	28.89 (97.83)
9th Gear									
203.00 (151.38)	17921 (79.72)	4.25 (6.84)	2101	4.2	0.455 (0.277)	15.39 (3.03)	219 (104)	59 (15)	28.89 (97.83)
10th Gear									
203.75 (151.94)	15393 (68.47)	4.96 (7.98)	2100	3.0	0.453 (0.275)	15.47 (3.05)	219 (104)	70 (21)	28.78 (97.46)
11th Gear									
204.54 (152.52)	13310 (59.20)	5.76 (9.27)	2100	2.5	0.450 (0.274)	15.56 (3.06)	219 (104)	66 (19)	28.76 (97.39)
12th Gear									
203.67 (151.87)	11468 (51.01)	6.66 (10.72)	2100	2.1	0.453 (0.275)	15.46 (3.05)	219 (104)	69 (21)	28.77 (97.43)
13th Gear									
201.13 (149.98)	9771 (43.46)	7.72 (12.42)	2100	1.7	0.458 (0.279)	15.28 (3.01)	219 (104)	72 (22)	28.77 (97.43)
14th Gear									
200.10 (149.21)	8469 (37.67)	8.86 (14.26)	2100	1.4	0.461 (0.281)	15.18 (2.99)	220 (104)	73 (23)	28.78 (97.46)

reverse 1.34 (2.15), 1.78 (2.87), 2.37 (3.81), 3.13 (5.04), 3.58 (5.76), 4.77 (7.68), 6.34 (10.21), 8.39 (13.50), 11.25 (18.11), 15.01 (24.15), 18.64 (30.00) electronically limited **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1958 or 1723 engine rpm or 1000 rpm at 1950 engine rpm **Unladen tractor mass** 24090 lb (10927 kg)

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**NOTE 1:** The manufacturer declares that the average time between active regenerations is 40 hours, while operated in Auto Filter Cleaning Mode, at rated speed, full load, under steady state conditions. A 5% power increase was observed during the active regeneration.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor fell 0.85% short of meeting the manufacturer's remote hydraulic flow claim of 59 GPM (223.3 l/min) with the 85 cc pump. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

**REPORT REISSUED.** Supplemental sales permit for John Deere 7R 270 Diesel, January, 2021.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2084A**, Nebraska Summary 933A, January 14, 2021.

Roger M. Hoy  
 Director

M.F. Kocher  
 P.J. Jasa  
 J.D. Luck  
 Board of Tractor Test Engineers

**TRACTOR SOUND LEVEL WITH CAB**

	Front Wheel Drive Engaged dB(A)	Disengaged dB(A)
At no load in 9th gear	66.8	66.6
Transport speed - no load - 21st gear		69.0
Bystander in 21st gear		84.4

Horizontal distance of drawbar hitch point behind rear wheel axis - 47.4"(1203 mm)

**TIRES 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**

Four 480/80R46;\*\*\*;12(85)  
 Two 420/90R30;\*\*\*;15(105)  
 18.5 in (470 mm)  
 16215 lb (7355 kg)  
 8050 lb (3651 kg)  
 24265 lb(11006 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED - AUTO MODE**  
**(Loads based on 2100 engine rpm manual mode performance runs)**  
**DRAWBAR POWER AT SELECTED TRAVEL SPEEDS**

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	
3.4 mph (5.4 km/h)									
171.67 (128.01)	22081 (98.22)	2.92 (4.70)	1297	7.8	0.464 (0.282)	15.10 (2.98)	217 (103)	53 (11)	28.90 (97.87)
3.9 mph (6.2 km/h)									
200.08 (149.20)	20810 (92.57)	3.61 (5.80)	1574	6.1	0.438 (0.266)	16.00 (3.15)	218 (103)	57 (14)	28.89 (97.83)
4.5 mph (7.2 km/h)									
200.90 (149.81)	17600 (78.29)	4.28 (6.89)	1582	3.9	0.434 (0.264)	16.12 (3.17)	219 (104)	71 (22)	28.78 (97.46)
5.1 mph (8.2 km/h)									
203.29 (151.59)	15495 (68.93)	4.92 (7.92)	1566	3.0	0.432 (0.263)	16.22 (3.20)	219 (104)	69 (21)	28.78 (97.46)
6.0 mph (9.6 km/h)									
204.66 (152.61)	13261 (58.99)	5.79 (9.32)	1586	2.5	0.432 (0.263)	16.19 (3.19)	219 (104)	72 (22)	28.78 (97.46)
6.8 mph (11.0 km/h)									
203.46 (151.72)	11451 (50.94)	6.66 (10.72)	1589	2.1	0.435 (0.264)	16.11 (3.17)	219 (104)	69 (21)	28.77 (97.43)
8.0 mph (12.8 km/h)									
201.19 (150.02)	9691 (43.11)	7.79 (12.53)	1601	1.7	0.438 (0.266)	16.00 (3.15)	219 (104)	72 (22)	28.78 (97.46)
9.1 mph (14.6 km/h)									
200.09 (149.21)	8397 (37.35)	8.94 (14.39)	1578	1.4	0.443 (0.269)	15.81 (3.12)	219 (104)	73 (23)	28.78 (97.46)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED - 1800 ENGINE RPM**  
**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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
7th Gear									
180.53 (134.62)	23296 (103.63)	2.91 (4.68)	2118	14.3	0.501 (0.305)	13.98 (2.75)	219 (104)	48 (9)	28.89 (97.83)
8th Gear									
204.93 (152.81)	22038 (98.03)	3.49 (5.62)	2050	7.9	0.467 (0.284)	14.99 (2.95)	219 (104)	58 (14)	28.89 (97.83)
9th Gear									
217.43 (162.13)	20812 (92.57)	3.92 (6.31)	1978	6.2	0.454 (0.276)	15.43 (3.04)	219 (104)	58 (14)	28.89 (97.83)
10th Gear									
224.15 (167.14)	19005 (84.54)	4.43 (7.12)	1902	4.6	0.448 (0.273)	15.62 (3.08)	220 (104)	69 (21)	28.79 (97.49)
11th Gear									
229.48 (171.12)	17657 (78.54)	4.87 (7.84)	1800	3.8	0.439 (0.267)	15.94 (3.14)	220 (104)	69 (20)	28.77 (97.43)
12th Gear									
230.65 (171.99)	15288 (68.00)	5.66 (9.11)	1800	3.0	0.438 (0.267)	15.98 (3.15)	220 (104)	70 (21)	28.78 (97.46)
13th Gear									
230.05 (171.55)	13130 (58.40)	6.57 (10.57)	1800	2.5	0.438 (0.266)	15.99 (3.15)	221 (105)	73 (23)	28.78 (97.46)
14th Gear									
229.24 (170.94)	11389 (50.66)	7.55 (12.15)	1799	2.0	0.438 (0.266)	16.00 (3.15)	221 (105)	73 (23)	28.78 (97.46)
15th Gear									
227.44 (169.60)	9749 (43.36)	8.75 (14.08)	1800	1.7	0.443 (0.269)	15.82 (3.12)	220 (104)	73 (23)	28.78 (97.46)

**Shiftable PTO Performance**  
**540 rpm shaft limited to 80 hp(60 kW)**

Economy mode

539 PTO rpm @ 1720 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption	
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)
79.93 (59.60)	1720	5.16 (19.52)	0.452 (0.275)	15.50 (3.05)	0.17 (0.64)
60.11 (44.83)	1720	4.25 (16.09)	0.495 (0.301)	14.14 (2.79)	0.11 (0.42)
40.01 (29.83)	1720	3.34 (12.66)	0.585 (0.356)	11.97 (2.36)	0.09 (0.34)
19.96 (14.89)	1720	2.42 (9.16)	0.848 (0.516)	8.25 (1.63)	0.11 (0.42)
0.12 (0.09)	1720	1.67 (6.32)	95.599 (58.193)	0.07 (0.01)	0.11 (0.42)

Normal mode

538 PTO rpm @ 1950 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption	
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)
79.75 (59.47)	1950	5.53 (20.94)	0.486 (0.296)	14.42 (2.84)	0.17 (0.64)
59.85 (44.63)	1950	4.62 (17.51)	0.541 (0.329)	12.94 (2.55)	0.10 (0.38)
39.96 (29.80)	1950	3.77 (14.28)	0.661 (0.402)	10.59 (2.09)	0.09 (0.34)
19.95 (14.88)	1950	2.79 (10.57)	0.980 (0.596)	7.15 (1.41)	0.08 (0.30)
0.13 (0.10)	1950	2.01 (7.60)	107.320 (65.328)	0.07 (0.01)	0.15 (0.57)

## HYDRAULIC PERFORMANCE

CATEGORY: III

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range: lift cylinders  
 15862 lbs (70.6 kN) (2x100 mm)  
 18302 lbs (81.4 kN) (1x100 mm & 1x115 mm)

i) Sustained pressure at compensator cutoff: 63 cc pump 85 cc pump  
 2955 psi (204 bar)      2887 psi (199 bar)  
three outlet sets combined

ii) Pump delivery rate at minimum pressure and rated engine speed: 44.4 GPM (168.1 l/min)    58.5 GPM (221.4 l/min)

iii) Pump delivery rate at maximum hydraulic power: 43.3 GPM (164.0 l/min)    58.3 GPM (220.7 l/min)  
 Delivery pressure: 2761 psi (190 bar)      2773 psi (191 bar)  
 Power: 69.8 HP (52.0 kW)      94.3 HP (70.3 kW)

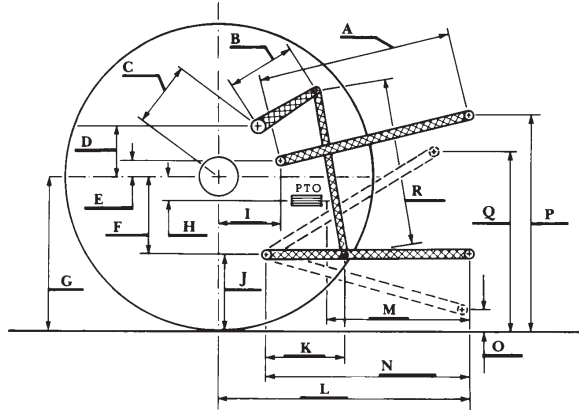
ii) Pump delivery rate at minimum pressure and rated engine speed: single outlet set  
 36.1 GPM (136.5 l/min)    36.5 GPM (138.1 l/min)

iii) Pump delivery rate at maximum hydraulic power: 35.5 GPM (134.5 l/min)    34.2 GPM (129.5 l/min)  
 Delivery pressure: 2298 psi (158 bar)      2291 psi (158 bar)  
 Power: 47.6 HP (35.5 kW)      45.7 HP (34.1 kW)

### HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.0	710
B	20.5	520
C	22.9	581
D	18.9	480
E	7.3	185
F	14.4	365
G	38.8	985
H	3.5	90
I	22.4	570
J	24.4	620
K	29.3	745
L	52.0	1321
*L'	56.0	1423
M	28.0	712
N	43.4	1102
O	9.0	230
P	51.9	1319
Q	39.4	1001
R	44.9	1140

\*L' to Quick Attach ends



### RECOMMENDED CITATION FORMAT:

NTTL.(2021). Nebraska OECD tractor test 2084A for John Deere 7R 270 e23 Diesel.  
 Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



**JOHN DEERE 7R 270 e23 DIESEL**  
 Institute of Agriculture and Natural Resources  
 University of Nebraska–Lincoln