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2022

Test 2258: John Deere 9R 390

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2258—SUMMARY 1221

JOHN DEERE 9R 390 DIESEL

18 SPEED

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)	
MAXIMUM POWER AND FUEL CONSUMPTION						
SEE NOTE 1 - PAGE 2						
Rated Engine Speed—(PTO speed—1108 rpm)						
323.38 (241.14)	2099	18.57 (70.30)	0.404 (0.246)	17.41 (3.43)	0.68 (2.59)	Fuel used during active exhaust regeneration-1.14 gal (4.33 l) (see note 2, p.2)
Standard Power Take-off Speed(1000 rpm)						
364.16 (271.56)	1895	19.87 (75.22)	0.384 (0.233)	18.33 (3.61)	0.75 (2.83)	
Maximum Power (1 hour)						
370.61 (276.36)	1800	19.93 (75.46)	0.378 (0.230)	18.59 (3.66)	0.81 (3.06)	

VARYING POWER AND FUEL CONSUMPTION

323.38 (241.14)	2099	18.57 (70.30)	0.404 (0.246)	17.41 (3.43)	0.68 (2.59)	Air temperature
281.89 (210.20)	2150	16.92 (64.06)	0.422 (0.257)	16.66 (3.28)	0.76 (2.87)	74°F (23°C)
211.21 (157.50)	2150	13.69 (51.82)	0.456 (0.277)	15.43 (3.04)	0.67 (2.53)	Relative humidity
140.98 (105.13)	2150	11.36 (42.99)	0.567 (0.345)	12.41 (2.45)	0.50 (1.89)	37%
70.45 (52.54)	2150	8.45 (31.99)	0.844 (0.513)	8.34 (1.64)	0.32 (1.23)	Barometer
1.03 (0.77)	2150	5.85 (22.14)	40.086 (24.383)	0.18 (0.03)	0.39 (1.46)	28.88" Hg (97.80 kPa)

Maximum Torque - 1184 lb.-ft. (1606 Nm) at 1499 rpm

Maximum Torque Rise - 46.4%

Torque rise at 1679 engine rpm - 42%

Power increase at 1800 engine rpm - 14.6%

DRAWBAR PERFORMANCE (Unballasted)

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)	D.E.F. Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
Power at Rated Engine Speed—7th Gear- Manual mode										
296.94 (221.42)	21456 (95.44)	5.19 (8.35)	2099	1.7	0.443 (0.270)	15.88 (3.13)	0.020 (0.012)	201 (94)	54 (12)	29.06 (98.41)
75% of Pull at Rated Engine Speed—7th Gear - Manual mode										
230.08 (171.57)	16060 (71.44)	5.37 (8.64)	2164	1.3	0.487 (0.296)	14.44 (2.85)	0.022 (0.014)	197 (91)	61 (16)	29.02 (98.27)
50% of Pull at Rated Engine Speed—7th Gear- Manual mode										
155.21 (115.74)	10708 (47.63)	5.44 (8.75)	2181	0.9	0.586 (0.357)	12.00 (2.36)	0.029 (0.018)	198 (92)	61 (16)	29.01 (98.24)
75% of Pull at Reduced Engine Speed—5.3 mph (8.6 km/h)-Auto mode										
230.27 (171.71)	16172 (71.94)	5.34 (8.59)	1422	1.3	0.422 (0.256)	16.68 (3.29)	0.025 (0.015)	187 (86)	61 (16)	29.01 (98.24)
50% of Pull at Reduced Engine Speed—5.5 mph (8.8 km/h)-Auto mode										
155.56 (116.00)	10643 (47.34)	5.48 (8.82)	1454	0.9	0.468 (0.285)	15.03 (2.96)	0.020 (0.012)	185 (85)	61 (16)	28.99 (98.17)

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

Dates of tests: September 21 to 27, 2022

Manufacturer: John Deere Tractor Works, 3500 East Donald St., 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)** 0.8447 **Fuel weight** 7.034 lbs/gal (0.843 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE 10W-30 API service classification** CJ-4 **Transmission, hydraulic and final drive lubricant** John Deere Hy-Gard fluid **Total time engine was operated:** 24.5 hours

ENGINE: Make John Deere **Diesel Type** six cylinder vertical with one turbocharger, air to air aftercooler and D.E.F.(diesel exhaust fluid) exhaust treatment **Serial No.** *RG6136U000924* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.197" x 6.496" (132.0 mm x 165.0 mm) **Compression ratio** 15.9 to 1 **Displacement** 826 cu in (13548 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** radiator for crankcase oil, radiator for transmission/hydraulic oil also feeding front and rear axles **Fuel filter** two paper cartridges **Fuel cooler** radiator for returned fuel **Exhaust** DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) integrated within a vertical muffler **Cooling medium temperature control** 1 thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 124.7 - 135.1 lb/h (56.5 - 61.3 kg/h) **High idle:** 2150 - 2250 rpm (2125 - 2175 rpm with PTO engaged) **Turbo boost:** nominal 21.0 - 23.9 psi (145 - 165 kPa) as measured 22.7 psi (156 kPa)

CHASSIS: Type four wheel drive with duals **Serial No.** *1RW9490DLNA075248* **Tread width** rear 134.1" (3406 mm) to 143.6" (3648 mm), front 134.1" (3406 mm) to 143.6" (3648 mm) **Wheelbase** 154.0" (3912 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 2.56 (4.12) second 3.16 (5.09) third 3.48 (5.60) fourth 3.91 (6.29) fifth 4.30 (6.92) sixth 4.82 (7.76) seventh 5.31 (8.55) eighth 5.91 (9.51) ninth 6.56 (10.55) tenth 7.29 (11.73) eleventh 8.03 (12.92) twelfth 8.84 (14.22) thirteenth 9.91 (15.95) fourteenth 10.91 (17.55) fifteenth 13.47 (21.68) sixteenth 16.63 (26.76) seventeenth 20.38 (32.79) eighteenth 24.86 (40.00) (electronically limited)

DRAWBAR PERFORMANCE
(Unballasted at 2100 rpm - manual mode)

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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp.°F cool- ing med	°C Air dry bulb	Barom. inch Hg (kPa)
1st Gear										
277.57 (206.98)	44435 (197.66)	2.34 (3.77)	2104	8.4	0.470 (0.286)	15.01 (2.96)	0.022 (0.013)	207 (97)	48 (9)	28.95 (98.02)
2nd Gear										
290.51 (216.63)	35860 (159.51)	3.04 (4.89)	2099	3.5	0.450 (0.273)	15.67 (3.09)	0.022 (0.013)	207 (97)	51 (11)	28.94 (98.00)
3rd Gear										
295.89 (220.64)	33021 (146.88)	3.36 (5.41)	2100	3.1	0.441 (0.268)	15.97 (3.15)	0.023 (0.014)	205 (96)	58 (14)	28.95 (98.04)
4th Gear										
296.53 (221.12)	29370 (130.64)	3.79 (6.10)	2100	2.6	0.441 (0.268)	15.97 (3.15)	0.022 (0.013)	206 (97)	64 (18)	28.94 (98.00)
5th Gear										
295.79 (220.57)	26567 (118.18)	4.18 (6.72)	2100	2.4	0.442 (0.269)	15.95 (3.14)	0.022 (0.013)	203 (95)	69 (21)	28.94 (97.99)
6th Gear										
294.41 (219.54)	23495 (104.51)	4.70 (7.56)	2099	2.0	0.444 (0.270)	15.83 (3.12)	0.021 (0.013)	206 (96)	58 (14)	28.89 (97.83)
7th Gear										
296.94 (221.42)	21456 (95.44)	5.19 (8.35)	2099	1.7	0.443 (0.270)	15.88 (3.13)	0.020 (0.012)	201 (94)	54 (12)	29.06 (98.41)
8th Gear										
296.28 (220.93)	19209 (85.44)	5.78 (9.30)	2100	1.6	0.445 (0.270)	15.82 (3.12)	0.020 (0.012)	200 (93)	55 (13)	29.07 (98.44)
9th Gear										
294.61 (219.69)	17191 (76.47)	6.43 (10.35)	2100	1.5	0.446 (0.271)	15.78 (3.11)	0.020 (0.012)	203 (95)	56 (13)	29.07 (98.43)
10th Gear										
292.62 (218.21)	15330 (68.19)	7.16 (11.52)	2100	1.3	0.448 (0.272)	15.70 (3.09)	0.021 (0.013)	205 (96)	57 (14)	29.07 (98.44)
11th Gear										
291.60 (217.45)	13849 (61.60)	7.90 (12.71)	2100	1.2	0.449 (0.273)	15.67 (3.09)	0.021 (0.013)	207 (97)	58 (14)	29.06 (98.39)
12th Gear										
293.39 (218.78)	12652 (56.28)	8.70 (13.99)	2100	1.0	0.444 (0.270)	15.86 (3.12)	0.021 (0.013)	207 (97)	59 (15)	29.06 (98.41)

TRACTOR SOUND LEVEL WITH CAB

	dB(A)
At no load in 6th gear	71.3
Transport speed - no load - 18th gear	73.7
Bystander in 18th gear	85.0

Horizontal distance of drawbar hitch point behind rear wheel axis - 44.0"(1377 mm), 49.9"(1268 mm)

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

Four 650/85R38;***;9(60)
Four 650/85R38;***;9(60)
22.5 in (570 mm)
19775 lb (8970 kg)
27025 lb(12258 kg)
46800 lb(21228 kg)

reverse 2.56 (4.12), 3.48 (5.60), 3.91 (6.29), 5.31 (8.55), 5.91 (9.51), 8.03 (12.92) **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1000 rpm at 1895 engine rpm **Unladen tractor mass** 46625 lb (21149 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1. With stationary PTO operation, using FieldCruise™, an isochronous governor is utilized. All PTO tests were conducted with FieldCruise™ engaged.

NOTE 2. The manufacturer declares that the average time between active regenerations is over 50 hours. A 1% power decrease was observed during the active exhaust regeneration.

NOTE 3: The performance figures on this report are the result of replacing the electronic control module of the John Deere 9R 490 with the John Deere 9R 390 module.

NOTE 4: The John Deere 9R 390 T.E.C.U. (Tractor Electronic Control Unit) is compliant with ISOBUS 11783.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. The drawbar pull in 1st gear was limited to avoid excessive power hop. The manufacturer's remote hydraulic flow claim of 42.0 GPM (159 l/min) with the optional 3/4" coupler set was not verified. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 2258, Nebraska Summary 1221, February 9, 2023.

Roger M. Hoy
Director

P.J. Jasa
J.D. Luck
S. Pitla
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE
UNBALLASTED - 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		D.E.F. Consumption	Temp. °F (°C)		Barom. inch dry Hg (kPa)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.l/l)	lb/hp.hr (kg/kW.h)	cool- ing med	Air dry bulb	
3.1 mph (5.0 km/h)										
290.14 (216.35)	35811 (159.29)	3.04 (4.89)	1545	3.6	0.408 (0.248)	17.29 (3.41)	0.027 (0.016)	194 (90)	56 (13)	28.95 (98.04)
3.5 mph (5.6 km/h)										
295.89 (220.65)	32450 (144.34)	3.42 (5.50)	1730	3.1	0.418 (0.254)	16.88 (3.32)	0.019 (0.011)	205 (96)	63 (17)	28.94 (98.00)
3.9 mph (6.2 km/h)										
296.95 (221.44)	29239 (130.06)	3.81 (6.13)	1712	2.6	0.418 (0.254)	16.87 (3.32)	0.020 (0.012)	205 (96)	67 (19)	28.94 (98.00)
4.2 mph (6.8 km/h)										
295.12 (220.07)	26519 (117.96)	4.17 (6.71)	1698	2.4	0.415 (0.252)	17.00 (3.35)	0.018 (0.011)	207 (97)	70 (21)	28.92 (97.93)
4.7 mph (7.6 km/h)										
294.12 (219.32)	23538 (104.70)	4.69 (7.55)	1708	2.0	0.415 (0.253)	16.94 (3.34)	0.017 (0.010)	202 (94)	63 (17)	28.89 (97.83)
5.2 mph (8.4 km/h)										
296.65 (221.21)	21381 (95.11)	5.20 (8.37)	1705	1.8	0.420 (0.256)	16.73 (3.30)	0.017 (0.011)	190 (88)	55 (13)	29.07 (98.44)
5.8 mph (9.4 km/h)										
296.39 (221.01)	19037 (84.68)	5.84 (9.40)	1717	1.5	0.422 (0.257)	16.66 (3.28)	0.018 (0.011)	194 (90)	56 (13)	29.06 (98.41)
6.5 mph (10.4 km/h)										
294.23 (219.40)	17052 (75.85)	6.47 (10.41)	1900	1.4	0.433 (0.264)	16.24 (3.20)	0.017 (0.011)	194 (90)	57 (14)	29.07 (98.44)
7.2 mph (11.6 km/h)										
292.03 (217.76)	15203 (67.63)	7.20 (11.59)	1917	1.2	0.431 (0.262)	16.31 (3.21)	0.021 (0.013)	206 (97)	58 (14)	29.06 (98.41)
8.0 mph (12.8 km/h)										
291.54 (217.40)	13891 (61.79)	7.87 (12.67)	1902	1.1	0.430 (0.261)	16.37 (3.22)	0.019 (0.012)	204 (96)	58 (14)	29.06 (98.41)
8.7 mph (14.0 km/h)										
292.91 (218.42)	12578 (55.95)	8.73 (14.05)	1880	1.0	0.432 (0.263)	16.27 (3.20)	0.020 (0.012)	204 (96)	59 (15)	29.05 (98.37)

DRAWBAR PERFORMANCE
(Unballasted at 1800 RPM, Manual mode)
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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
277.02 (206.57)	44329 (197.19)	2.35 (3.77)	2104	8.4	1st Gear					
					0.471 (0.286)	14.97 (2.95)	0.022 (0.013)	207 (97)	49 (9)	28.94 (98.00)
313.28 (233.61)	42609 (189.53)	2.76 (4.44)	1958	6.1	2nd Gear					
					0.444 (0.270)	15.86 (3.12)	0.019 (0.011)	207 (97)	53 (12)	28.95 (98.04)
324.95 (242.32)	41069 (182.68)	2.97 (4.78)	1896	5.3	3rd Gear					
					0.430 (0.261)	16.39 (3.23)	0.019 (0.011)	207 (97)	60 (16)	28.95 (98.04)
330.50 (246.45)	37587 (167.19)	3.30 (5.31)	1856	4.1	4th Gear					
					0.423 (0.258)	16.64 (3.28)	0.018 (0.011)	207 (97)	66 (19)	28.94 (98.00)
333.83 (248.93)	35378 (157.37)	3.54 (5.70)	1800	3.6	5th Gear					
					0.419 (0.255)	16.82 (3.31)	0.018 (0.011)	206 (97)	69 (21)	28.93 (97.97)
333.59 (248.76)	31228 (138.91)	4.01 (6.45)	1800	2.6	6th Gear					
					0.422 (0.257)	16.68 (3.29)	0.018 (0.011)	205 (96)	54 (12)	29.06 (98.41)
337.30 (251.52)	28587 (127.16)	4.42 (7.11)	1800	2.4	7th Gear					
					0.417 (0.254)	16.86 (3.32)	0.018 (0.011)	204 (96)	55 (13)	29.07 (98.44)
336.66 (251.04)	25583 (113.80)	4.94 (7.94)	1800	2.0	8th Gear					
					0.418 (0.254)	16.84 (3.32)	0.016 (0.010)	206 (96)	55 (13)	29.06 (98.41)
335.19 (249.95)	22911 (101.91)	5.49 (8.84)	1800	1.9	9th Gear					
					0.420 (0.255)	16.75 (3.30)	0.017 (0.011)	206 (96)	56 (13)	29.07 (98.44)
334.34 (249.31)	20511 (91.24)	6.11 (9.83)	1800	1.7	10th Gear					
					0.420 (0.256)	16.74 (3.30)	0.017 (0.010)	206 (97)	57 (14)	29.06 (98.41)
333.69 (248.83)	18557 (82.54)	6.74 (10.85)	1800	1.5	11th Gear					
					0.422 (0.256)	16.68 (3.29)	0.015 (0.009)	206 (96)	57 (14)	29.05 (98.37)
336.69 (251.07)	16993 (75.59)	7.43 (11.96)	1799	1.3	12th Gear					
					0.418 (0.254)	16.83 (3.32)	0.022 (0.013)	203 (95)	58 (14)	29.06 (98.41)
330.47 (246.43)	14842 (66.02)	8.35 (13.44)	1801	1.2	13th Gear					
					0.424 (0.258)	16.59 (3.27)	0.022 (0.013)	207 (97)	59 (15)	29.06 (98.41)

HYDRAULIC PERFORMANCE

CATEGORY: 4N/4			
Quick Attach: Yes			
OECD Static test			
Maximum force exerted through whole range:	<u>Category 4N</u>	<u>lift cylinders</u>	
	16084 lbs(71.5 kN) (1 x 90 mm and 1x100 mm) 21408 lbs(95.2 kN) (2 x 110 mm)		
	<u>Category 4</u>		
	15769 lbs(70.1 kN) (1 x 90 mm and 1x100 mm) 21384 lbs(95.1 kN) (2 x 110 mm)		
<u>Tandem pump system</u>			
	<u>Pump 1</u>	<u>Pump 2</u>	
	<u>three sets combined</u>		<u>two sets combined</u>
i) Sustained pressure at compensator cutoff:	2851 psi (197 bar)		2859 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	58.0 GPM (219.7 l/min)		58.4 GPM (220.9 l/min)
Combined flow:	116.4 GPM (440.6 l/min)		
iii) Pump delivery rate at maximum hydraulic power:	58.6 GPM (221.9 l/min)		58.0 GPM (219.5 l/min)
Delivery pressure:	2433 psi (168 bar)		2429 psi (167 bar)
Power:	83.2 HP (62.0 kW)		82.2 HP (61.3 kW)
<u>single outlet set - 1/2" couplers</u>			
i) Sustained pressure at compensator cutoff:	2851 psi (197 bar)		2859 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	36.7 GPM (139.0 l/min)		36.4 GPM (137.7 l/min)
iii) Pump delivery rate at maximum hydraulic power:	33.8 GPM (127.8 l/min)		34.5 GPM (130.6 l/min)
Delivery pressure:	2328 psi (161 bar)		2355 psi (162 bar)
Power:	45.9 HP (34.2 kW)		47.4 HP (35.3 kW)

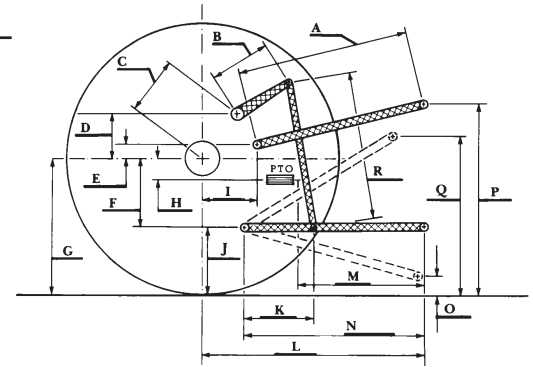
Category 4N

Category 4

	inch	mm	inch	mm
A	31.7	805	30.3	770
B	19.7	500	19.7	500
C	25.0	635	25.0	635
D	24.4	620	24.4	620
E	12.8	325	12.8	325
F	13.8	350	13.8	350
G	36.6	930	36.6	930
H	2.4	60	2.4	60
I	18.7	474	18.7	474
J	22.8	580	22.8	580
K	30.9	785	30.9	785
L	52.8	1342	52.8	1342
*L'	58.7	1491	59.6	1515
M	22.8	579	22.8	579
N	45.6	1159	45.6	1159
O	9.1	230	9.1	230
P	50.8	1290	50.8	1291
Q	41.1	1045	40.9	1040
R	47.0	1195	47.2	1200

*L' to Quick Attach ends

HITCH DIMENSIONS AS TESTED—NO LOAD



RECOMMENDED CITATION FORMAT:

NTTL.(2023).Nebraska OECD Tractor test 2258 for John Deere 9R 390 Diesel.
Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



JOHN DEERE 9R 390 DIESEL