

NEBRASKA OECD TRACTOR TEST 2170-SUMMARY 1051

JOHN DEERE 9470RX 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—1109 rpm)						
312.16 (232.78)	2101	20.24 (76.61)	0.454 (0.276)	15.42 (3.04)	0.43 (1.61)	Fuel used during active exhaust regeneration-2.92 gal (11.05 l) (see note 2, p.2)
Standard Power Take-off Speed(1000 rpm)						
349.60 (260.69)	1895	20.44 (77.39)	0.409 (0.249)	17.10 (3.37)	0.40 (1.51)	
Maximum Power (1 hour)						
363.62 (271.15)	1650	19.83 (75.08)	0.382 (0.232)	18.33 (3.61)	0.48 (1.82)	

VARYING POWER AND FUEL CONSUMPTION

312.16 (232.78)	2101	20.24 (76.61)	0.454 (0.276)	15.42 (3.04)	0.43 (1.61)	Air temperature
271.64 (202.56)	2150	19.00 (71.94)	0.490 (0.298)	14.29 (2.82)	0.43 (1.62)	73°F (23°C)
203.61 (151.83)	2150	15.99 (60.53)	0.550 (0.334)	12.73 (2.51)	0.31 (1.18)	Relative humidity
135.93 (101.36)	2150	12.99 (49.17)	0.669 (0.407)	10.46 (2.06)	0.25 (0.96)	21%
68.14 (50.81)	2150	10.06 (38.08)	1.034 (0.629)	6.77 (1.33)	0.21 (0.79)	Barometer
1.63 (1.22)	2150	7.50 (28.39)	32.213 (19.594)	0.22 (0.04)	0.16 (0.60)	28.85" Hg (97.71 kPa)

Maximum Torque - 1229 lb-ft (1666 Nm) at 1550 rpm

Maximum Torque Rise -57.5%

Torque rise at 1681 engine rpm -46%

Power increase at 1650 engine rpm - 16.5%

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)	Barom. inch Hg (kPa)
Power at Rated Engine Speed—7th Gear- Manual mode								
352.69 (263.00)	26188 (116.49)	5.05 (8.13)	2099	2.1	0.472 (0.287)	14.82 (2.92)	0.013 (0.008)	190 (88)
75% of Pull at Rated Engine Speed—7th Gear- Manual mode								
274.60 (204.77)	19606 (87.21)	5.25 (8.45)	2164	1.2	0.511 (0.311)	13.69 (2.70)	0.016 (0.009)	192 (89)
50% of Pull at Rated Engine Speed—7th Gear- Manual mode								
186.56 (139.12)	13119 (58.35)	5.33 (8.58)	2184	0.7	0.613 (0.373)	11.42 (2.25)	0.016 (0.010)	189 (87)
75% of Pull at Reduced Engine Speed—5.3 mph (8.6 km/h)-Auto mode								
274.29 (204.53)	19562 (87.01)	5.26 (8.47)	1584	1.3	0.430 (0.261)	16.29 (3.21)	0.013 (0.008)	197 (91)
50% of Pull at Reduced Engine Speed—5.3 mph (8.6 km/h)-Auto mode								
185.93 (138.63)	13187 (58.66)	5.29 (8.51)	1288	0.7	0.449 (0.273)	15.58 (3.07)	0.016 (0.009)	192 (89)

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

Dates of tests: November 14 - 28, 2016

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)** 0.8408 **Fuel weight** 7.001 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 10W-30 API service classification CJ-4** **Transmission, hydraulic and final drive lubricant** John Deere Hy-Gard fluid **Total time engine was operated:** 28.5 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.** *RG6135U007738* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.197" x 6.496" (132.0 mm x 165.0 mm) **Compression ratio** 16.0 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** engine coolant heat exchanger 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), SCR (selective catalyst reduction) and regenerative DPF (diesel particulate filter) integrated within a vertical muffler **Cooling medium temperature control** 3 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: Stationary PTO operation (395 engine hp) 137.3-148.8 lb/h (62.3-67.5 kg/h), (470 engine hp) 159.8-172.9 lb/h (72.5-78.4 kg/h) **High idle:** 2150 - 2250 rpm (2125 - 2175 rpm with PTO engaged) **Turbo boost:** (470 engine hp) nominal 31.9- 36.3 psi (220 - 250 kPa) as measured 34.0 psi (235 kPa)

CHASSIS: Type 4WD with rubber tracks **Serial No.** *1RW9470RAGP801124* **Track width** rear 88.0" (2235 mm) front 88.0" (2235 mm) **Wheelbase** 163.5" (4154 mm) **Length of track on ground** 72.4" (1839 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 2.50 (4.03) second 3.08 (4.96) third 3.41 (5.48) fourth 3.81 (6.13) fifth 4.19 (6.75) sixth 4.69 (7.55) seventh 5.18 (8.34) eighth 5.76 (9.27) ninth 6.38 (10.27) tenth 7.09 (11.41) eleventh 7.84 (12.61) twelfth 8.71 (14.02) thirteenth 9.64 (15.52) fourteenth 10.73 (17.26)

DRAWBAR PERFORMANCE
(Unballasted at 2100 engine 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)
					1st Gear					
314.10 (234.22)	53762 (239.14)	2.20 (3.53)	2098	12.0	0.528 (0.321)	13.25 (2.61)	0.013 (0.008)	189 (87)	47 (8)	28.73 (97.30)
					2nd Gear					
334.96 (249.78)	43744 (194.58)	2.87 (4.62)	2100	6.4	0.494 (0.301)	14.16 (2.79)	0.013 (0.008)	189 (87)	47 (8)	28.74 (97.33)
					3rd Gear					
344.52 (256.90)	40173 (178.70)	3.22 (5.17)	2100	5.2	0.478 (0.291)	14.65 (2.89)	0.012 (0.008)	188 (87)	48 (9)	28.73 (97.29)
					4th Gear					
343.74 (256.32)	35504 (157.93)	3.63 (5.84)	2100	4.3	0.475 (0.289)	14.73 (2.90)	0.013 (0.008)	201 (94)	78 (26)	28.39 (96.14)
					5th Gear					
344.98 (257.25)	32066 (142.63)	4.04 (6.49)	2100	3.3	0.473 (0.288)	14.80 (2.92)	0.014 (0.009)	200 (93)	77 (25)	28.41 (96.21)
					6th Gear					
348.68 (260.01)	28722 (127.76)	4.55 (7.32)	2100	2.6	0.474 (0.288)	14.77 (2.91)	0.013 (0.008)	191 (88)	62 (17)	28.68 (97.12)
					7th Gear					
352.69 (263.00)	26188 (116.49)	5.05 (8.13)	2099	2.1	0.472 (0.287)	14.82 (2.92)	0.013 (0.008)	190 (88)	58 (14)	28.68 (97.12)
					8th Gear					
351.36 (262.01)	23389 (104.04)	5.63 (9.06)	2099	1.8	0.472 (0.287)	14.83 (2.92)	0.013 (0.008)	193 (89)	65 (18)	28.66 (97.05)
					9th Gear					
346.18 (258.15)	20727 (92.20)	6.27 (10.08)	2100	1.5	0.478 (0.291)	14.64 (2.88)	0.013 (0.008)	193 (89)	68 (20)	28.67 (97.09)
					10th Gear					
342.13 (255.13)	18384 (81.78)	6.98 (11.23)	2100	1.2	0.480 (0.292)	14.60 (2.88)	0.014 (0.008)	195 (91)	69 (21)	28.67 (97.09)
					11th Gear					
342.02 (255.04)	16598 (73.83)	7.73 (12.44)	2100	0.9	0.481 (0.293)	14.56 (2.87)	0.015 (0.009)	196 (91)	70 (21)	28.65 (97.02)
					12th Gear					
339.50 (253.16)	14790 (65.79)	8.61 (13.86)	2100	0.7	0.484 (0.294)	14.48 (2.85)	0.015 (0.009)	199 (93)	71 (22)	28.65 (97.02)

fifteenth 13.26 (21.34) sixteenth 16.32 (26.26) seventeenth 20.04 (32.25) eighteenth 24.67 (39.70) reverse 2.50 (4.03), 3.41 (5.48), 3.81 (6.13), 5.18 (8.34), 5.76 (9.27), 7.84 (12.61) **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** 60050 lb (27238 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1. In stationary PTO operation, this model operates in a derated power mode. 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 50 hours.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. 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. **2170**, Nebraska Summary 1051, March 3, 2017.

Roger M. Hoy
Director

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

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 6th gear	72.8
Transport speed- no load- 18th gear	77.3
Bystander in 17th gear	90.5

TRACKS AND WEIGHT

Rear tracks - no & size
Front tracks - no & size
Height of drawbar
Static weight with operator- Rear
- Front
- Total

Tested Without Ballast

2 x 30.0 in (760 mm)
2 x 30.0 in (760 mm)
21.0 in (545 mm)
28770 lb (13050 kg)
31455 lb (14268 kg)
60225 lb (27318 kg)

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 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)
3.5 mph (5.6 km/h)										
344.98 (257.25)	39232 (174.51)	3.30 (5.31)	1744	4.9	0.431 (0.262)	16.23 (3.20)	0.011 (0.006)	190 (88)	48 (9)	28.73 (97.29)
3.9 mph (6.2 km/h)										
343.90 (256.45)	35044 (155.88)	3.68 (5.92)	1726	4.1	0.432 (0.262)	16.22 (3.20)	0.014 (0.008)	205 (96)	78 (26)	28.37 (96.07)
4.2 mph (6.8 km/h)										
344.84 (257.14)	31746 (141.21)	4.08 (6.56)	1713	3.3	0.425 (0.258)	16.48 (3.25)	0.013 (0.008)	206 (97)	78 (25)	28.39 (96.14)
4.7 mph (7.6 km/h)										
349.44 (260.58)	28580 (127.13)	4.59 (7.38)	1723	2.6	0.425 (0.258)	16.48 (3.25)	0.010 (0.006)	194 (90)	64 (18)	28.68 (97.12)
5.2 mph (8.4 km/h)										
352.89 (263.15)	25995 (115.63)	5.09 (8.19)	1719	2.2	0.428 (0.260)	16.37 (3.22)	0.011 (0.006)	192 (89)	59 (15)	28.69 (97.15)
5.7 mph (9.2 km/h)										
350.97 (261.71)	23525 (104.64)	5.59 (9.00)	1883	1.8	0.443 (0.269)	15.81 (3.12)	0.011 (0.007)	196 (91)	66 (19)	28.67 (97.09)
6.3 mph (10.2 km/h)										
344.38 (256.80)	20747 (92.28)	6.23 (10.02)	1878	1.4	0.442 (0.269)	15.83 (3.12)	0.011 (0.007)	196 (91)	68 (20)	28.66 (97.05)
7.1 mph (11.4 km/h)										
342.06 (255.07)	18387 (81.79)	6.98 (11.23)	1899	1.1	0.448 (0.273)	15.61 (3.08)	0.011 (0.007)	198 (92)	70 (21)	28.64 (96.99)
7.8 mph (12.6 km/h)										
341.76 (254.85)	16586 (73.78)	7.73 (12.44)	1888	0.9	0.446 (0.271)	15.70 (3.09)	0.012 (0.008)	199 (93)	71 (22)	28.66 (97.05)
8.7 mph (14.0 km/h)										
339.85 (253.43)	14821 (65.92)	8.60 (13.84)	1895	0.8	0.457 (0.278)	15.33 (3.02)	0.012 (0.007)	202 (94)	72 (22)	28.63 (96.95)

DRAWBAR PERFORMANCE
(Unballasted at 1800 ENGINE 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)
					1st Gear					
313.28 (233.61)	55762 (248.04)	2.11 (3.40)	2077	14.6	0.543 (0.331)	12.89 (2.54)	0.014 (0.008)	189 (87)	46 (8)	28.75 (97.36)
					2nd Gear					
358.82 (267.57)	52961 (235.58)	2.54 (4.09)	1968	11.6	0.496 (0.302)	14.12 (2.78)	0.011 (0.007)	191 (88)	47 (8)	28.74 (97.33)
					3rd Gear					
380.06 (283.41)	51106 (227.33)	2.79 (4.49)	1916	9.9	0.468 (0.285)	14.95 (2.94)	0.010 (0.006)	192 (89)	47 (8)	28.72 (97.26)
					4th Gear					
388.23 (289.50)	49165 (218.69)	2.96 (4.76)	1800	8.9	0.452 (0.275)	15.47 (3.05)	0.010 (0.006)	193 (89)	47 (9)	28.74 (97.33)
					5th Gear					
399.24 (297.71)	44827 (199.40)	3.34 (5.38)	1800	6.7	0.439 (0.267)	15.94 (3.14)	0.009 (0.005)	194 (90)	48 (9)	28.73 (97.29)
					6th Gear					
401.52 (299.41)	39578 (176.05)	3.81 (6.12)	1800	5.0	0.437 (0.266)	16.03 (3.16)	0.009 (0.006)	195 (90)	49 (9)	28.71 (97.22)
					7th Gear					
400.97 (299.00)	35468 (157.77)	4.24 (6.82)	1801	4.2	0.432 (0.263)	16.21 (3.19)	0.012 (0.007)	214 (101)	75 (24)	28.44 (96.31)
					8th Gear					
404.75 (301.82)	31992 (142.31)	4.75 (7.64)	1800	3.4	0.427 (0.260)	16.41 (3.23)	0.013 (0.008)	214 (101)	76 (24)	28.44 (96.31)
					9th Gear					
406.05 (302.79)	28696 (127.65)	5.31 (8.55)	1800	2.5	0.427 (0.260)	16.39 (3.23)	0.011 (0.006)	208 (98)	67 (20)	28.50 (96.51)
					10th Gear					
407.02 (303.51)	25760 (114.58)	5.93 (9.54)	1800	2.1	0.427 (0.260)	16.39 (3.23)	0.012 (0.007)	208 (98)	65 (19)	28.50 (96.51)
					11th Gear					
406.56 (303.17)	23184 (103.13)	6.58 (10.58)	1800	1.7	0.429 (0.261)	16.32 (3.21)	0.011 (0.007)	207 (97)	65 (18)	28.54 (96.65)
					12th Gear					
406.09 (302.82)	20779 (92.43)	7.33 (11.80)	1800	1.4	0.428 (0.260)	16.36 (3.22)	0.011 (0.007)	211 (99)	72 (22)	28.48 (96.44)
					13th Gear					
395.81 (295.16)	18215 (81.02)	8.15 (13.12)	1802	1.2	0.440 (0.268)	15.92 (3.14)	0.012 (0.007)	214 (101)	74 (23)	28.47 (96.41)

Lugging ability in 11th gear

Crankshaft speed rpm	2100	1999	1900	1800	1699	1600	1400	1100
Pull-lbs (kN)	16452 (73.18)	19679 (87.54)	21661 (96.35)	23244 (103.39)	24558 (109.24)	25359 (112.80)	24641 (109.61)	22815 (101.48)
Increase in pull%	0	20	32	41	49	54	50	39
Power-Hp (kW)	339.16 (252.91)	384.82 (286.96)	401.60 (299.47)	407.44 (303.82)	406.03 (302.77)	394.14 (293.91)	335.54 (250.21)	244.64 (182.42)
Speed-mpH (km/h)	7.73 (12.44)	7.33 (11.80)	6.95 (11.18)	6.58 (10.58)	6.20 (9.98)	5.83 (9.38)	5.11 (8.22)	4.02 (6.47)
Slip %	1.0	1.3	1.5	1.7	1.8	2.0	1.9	1.6

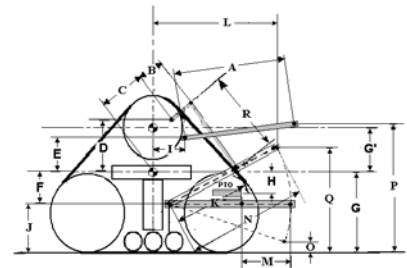
HYDRAULIC PERFORMANCE

CATEGORY: 4N/4	Category 4N	lift cylinders
Quick Attach: Yes	15648 lbs (69.6 kN)	(1 x 90 mm and 1x100 mm)
OECD Static test	20965 lbs (93.3 kN)	(2 x 110 mm)
	Category 4	
	15501 lbs (69.0 kN)	(1 x 90 mm and 1x100 mm)
	20527 lbs (91.3 kN)	(2 x 110 mm)
	Base pump	Tandem pump
	<u>three outlet sets combined</u>	
i) Sustained pressure at compensator cutoff:	2949 psi (203 bar)	2933 psi (202 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	59.7 GPM (235.8 l/min)	56.9 GPM (215.4 l/min)
Combined flow:	116.6 GPM (449.4 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	60.2 GPM (227.8 l/min)	57.2 GPM (216.5 l/min)
Delivery pressure:	2511 psi (173 bar)	2403 psi (166 bar)
Power:	88.2 HP (65.7 kW)	80.2 HP (59.8 kW)
	<u>single outlet set</u>	
	<u>3/4" couplers</u>	<u>1/2" couplers</u>
i) Sustained pressure at compensator cutoff:	2856 psi (197 bar)	2933 psi (202 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.1 GPM (163.2 l/min)	37.2 GPM (140.8 l/min)
iii) Pump delivery rate at maximum hydraulic power:	42.5 GPM (160.9 l/min)	36.9 GPM (139.8 l/min)
Delivery pressure:	2226 psi (153 bar)	2228 psi (154 bar)
Power:	55.2 HP (41.2 kW)	48.0 HP (35.8 kW)

	Category 4N		Category 4	
	inch	mm	inch	mm
A	30.7	780	29.9	760
B	19.7	500	19.7	500
C	34.8	885	34.8	885
D	28.7	730	28.7	730
E	18.7	475	18.7	475
F	12.5	318	12.5	318
G	33.1	842	33.1	842
*G'	19.5	495	19.5	495
H	2.2	57	2.2	57
I	28.8	733	28.8	733
J	20.6	524	20.6	524
K	30.9	785	30.9	785
L	52.8	1342	52.8	1342
*L'	58.7	1491	59.6	1515
M	14.7	374	14.7	374
N	45.6	1159	45.6	1159
O	9.0	230	9.0	230
P	47.6	1210	47.6	1210
Q	40.6	1032	40.4	1027
R	49.6	1260	48.6	1260

*G' to undercarriage pivot point
*L' to Quick Attach ends

HITCH DIMENSIONS AS TESTED—NO LOAD



JOHN DEERE 9470RX DIESEL

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln