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2015

Test 2110: John Deere 9470RT

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2110—SUMMARY 973

JOHN DEERE 9470RT DIESEL

18 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption Gal/hr (l/h)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION						
SEE NOTE 1 - PAGE 2						
Rated Engine Speed—(PTO speed—1108 rpm)						
311.87 (232.56)	2099	20.43 (77.33)	0.461 (0.280)	15.27 (3.01)	0.31 (1.19)	Fuel used during active exhaust regeneration-3.03 gal (11.45 l) (see note 2, p.2)
Standard Power Take-off Speed(1000 rpm)						
346.31 (258.25)	1895	20.59 (77.92)	0.418 (0.254)	16.82 (3.31)	0.30 (1.15)	
Maximum Power (1 hour)						
354.35 (264.24)	1679	19.88 (75.27)	0.395 (0.240)	17.82 (3.51)	0.34 (1.27)	

VARYING POWER AND FUEL CONSUMPTION

311.87 (232.56)	2099	20.43 (77.33)	0.461 (0.280)	15.27 (3.01)	0.31 (1.19)	Air temperature
271.48 (202.44)	2150	19.02 (72.01)	0.493 (0.300)	14.27 (2.81)	0.32 (1.22)	74°F (23°C)
203.57 (151.80)	2150	15.92 (60.28)	0.550 (0.335)	12.78 (2.52)	0.29 (1.10)	Relative humidity
135.52 (101.06)	2150	12.95 (49.00)	0.672 (0.409)	10.47 (2.06)	0.24 (0.92)	63%
68.13 (50.80)	2150	9.99 (37.83)	1.032 (0.628)	6.82 (1.34)	0.20 (0.77)	Barometer
0.91 (0.68)	2150	7.47 (28.29)	57.896 (35.217)	0.12 (0.02)	0.13 (0.50)	28.57" Hg (96.74 kPa)

Maximum Torque - 1199 lb.-ft. (1626 Nm) at 1550 rpm

Maximum Torque Rise -53.7%

Torque rise at 1679 engine rpm -42%

Power increase at 1679 rpm -13.6%

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)	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)
Maximum Power—7th Gear- Manual mode										
359.26 (267.90)	26403 (117.44)	5.10 (8.21)	2100	1.6	0.458 (0.279)	15.36 (3.02)	0.012 (0.007)	194 (90)	64 (18)	28.82 (97.60)
75% of Pull at Maximum Power—7th Gear- Manual mode										
277.65 (207.04)	19825 (88.19)	5.25 (8.45)	2162	1.6	0.517 (0.314)	13.60 (2.68)	0.014 (0.009)	194 (90)	68 (20)	28.79 (97.49)
50% of Pull at Maximum Power—7th Gear- Manual mode										
188.92 (140.87)	13200 (58.72)	5.37 (8.63)	2186	0.6	0.599 (0.365)	11.74 (2.31)	0.015 (0.009)	190 (88)	69 (21)	28.76 (97.39)
75% of Pull at Reduced Engine Speed—5.3 mph (8.6 km/h)-Auto mode										
277.78 (207.14)	19761 (87.90)	5.28 (8.49)	1583	1.4	0.425 (0.258)	16.57 (3.26)	0.010 (0.006)	194 (90)	68 (20)	28.78 (97.46)
50% of Pull at Reduced Engine Speed—5.3 mph (8.6 km/h)-Auto mode										
188.99 (140.93)	13349 (59.38)	5.31 (8.55)	1287	0.6	0.430 (0.261)	16.37 (3.23)	0.012 (0.007)	192 (89)	70 (21)	28.75 (97.36)

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

Dates of tests: May 1 - 11, 2015

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** 7.033 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:** 31.0 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.** *RG6135U002035* **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 rear axle **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 track layer-rubber tracked **Serial No.** *1RW9470RAEP907005* **Track width** 107.4" (2728 mm) **Length of track on ground** 111.0" (2819 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 2.51 (4.04) second 3.09 (4.97) third 3.41 (5.49) fourth 3.82 (6.14) fifth 4.20 (6.76) sixth 4.70 (7.56) seventh 5.20 (8.36) eighth 5.77 (9.29) ninth 6.39 (10.29) tenth 7.10 (11.43) eleventh 7.85 (12.63) twelfth 8.73 (14.05) thirteenth 9.66 (15.55) fourteenth 10.75 (17.30) fifteenth 13.29 (21.39) sixteenth 16.35 (26.31)

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)	D.E.F Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
282.43 (210.61)	47531 (211.43)	2.23 (3.59)	2147	13.0	1st Gear 0.560 (0.340)	12.56 (2.48)	0.013 (0.008)	197 (92)	73 (23)	28.52 (96.58)
319.06 (237.92)	41976 (186.72)	2.85 (4.59)	2100	7.5	2nd Gear 0.510 (0.310)	13.80 (2.72)	0.012 (0.007)	202 (94)	74 (24)	28.53 (96.61)
332.56 (247.99)	38750 (172.37)	3.22 (5.17)	2100	5.5	3rd Gear 0.491 (0.299)	14.32 (2.82)	0.011 (0.007)	200 (93)	74 (23)	28.53 (96.61)
345.33 (257.51)	35215 (156.64)	3.68 (5.91)	2100	3.5	4th Gear 0.474 (0.289)	14.83 (2.92)	0.013 (0.008)	199 (93)	69 (21)	28.82 (97.60)
347.21 (258.91)	31883 (141.82)	4.09 (6.57)	2100	2.7	5th Gear 0.472 (0.287)	14.91 (2.94)	0.013 (0.008)	198 (92)	69 (21)	28.82 (97.60)
358.54 (267.36)	29263 (130.17)	4.60 (7.39)	2100	2.1	6th Gear 0.457 (0.278)	15.40 (3.03)	0.013 (0.008)	197 (92)	68 (20)	28.82 (97.60)
359.26 (267.90)	26403 (117.44)	5.10 (8.21)	2100	1.6	7th Gear 0.458 (0.279)	15.36 (3.02)	0.012 (0.007)	194 (90)	64 (18)	28.82 (97.60)
359.20 (267.86)	23696 (105.41)	5.69 (9.15)	2099	1.4	8th Gear 0.456 (0.277)	15.42 (3.04)	0.012 (0.007)	194 (90)	63 (17)	28.82 (97.60)
355.07 (264.78)	21087 (93.80)	6.32 (10.16)	2100	1.1	9th Gear 0.462 (0.281)	15.22 (3.00)	0.013 (0.008)	195 (90)	66 (19)	28.82 (97.60)
355.08 (264.78)	18983 (84.44)	7.02 (11.29)	2098	1.0	10th Gear 0.461 (0.280)	15.27 (3.01)	0.014 (0.009)	199 (93)	73 (23)	28.80 (97.53)
349.57 (260.67)	16870 (75.04)	7.77 (12.50)	2099	0.8	11th Gear 0.467 (0.284)	15.05 (2.96)	0.014 (0.008)	201 (94)	71 (22)	28.79 (97.49)
351.72 (262.28)	15240 (67.79)	8.66 (13.93)	2099	0.7	12th Gear 0.467 (0.284)	15.06 (2.97)	0.014 (0.008)	201 (94)	71 (22)	28.79 (97.49)

seventeenth 20.07 (32.30) eighteenth 24.72 (39.77) reverse 2.51 (4.04), 3.41 (5.49), 3.82 (6.14), 5.20 (8.36), 5.77 (9.29), 7.85 (12.63) **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated by foot pedal **Steering** electro-hydraulic differential steering controlled by steering wheel **Power take-off** 1000 rpm at 1895 engine rpm **Unladen tractor mass** 46990 lb (21314 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, while operated in Auto Filter Cleaning Mode, at rated speed, full PTO load, under steady state conditions.

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. **2110**, Nebraska Summary 973, July 5, 2015.

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	70.3
Transport speed - no load - 18th gear	71.8
Bystander in 18th gear	89.9

TRACKS AND WEIGHT

Track width	30.0 in (762 mm)
Height of Drawbar	20.0 in (510 mm)
Static Weight with operator-	47165 lb (21394 kg)

Tested Without Ballast

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)										
332.57 (248.00)	37808 (168.18)	3.30 (5.31)	1743	5.3	0.446 (0.271)	15.76 (3.10)	0.010 (0.006)	210 (99)	74 (24)	28.54 (96.65)
3.9 mph (6.2 km/h)										
345.50 (257.64)	34827 (154.92)	3.72 (5.99)	1725	3.5	0.434 (0.264)	16.19 (3.19)	0.010 (0.006)	205 (96)	70 (21)	28.82 (97.60)
4.2 mph (6.8 km/h)										
347.11 (258.84)	31617 (140.64)	4.12 (6.63)	1711	2.6	0.426 (0.259)	16.50 (3.25)	0.010 (0.006)	205 (96)	70 (21)	28.82 (97.60)
4.7 mph (7.6 km/h)										
357.97 (266.94)	29006 (129.03)	4.63 (7.45)	1722	2.1	0.411 (0.250)	17.10 (3.37)	0.009 (0.006)	205 (96)	69 (20)	28.82 (97.60)
5.2 mph (8.4 km/h)										
358.56 (267.38)	26180 (116.45)	5.14 (8.27)	1717	1.6	0.416 (0.253)	16.93 (3.33)	0.009 (0.005)	201 (94)	65 (19)	28.82 (97.60)
5.7 mph (9.2 km/h)										
359.09 (267.77)	23867 (106.17)	5.64 (9.08)	1693	1.3	0.413 (0.251)	17.01 (3.35)	0.009 (0.005)	199 (93)	63 (17)	28.82 (97.60)
6.3 mph (10.2 km/h)										
354.83 (264.59)	21221 (94.39)	6.27 (10.09)	1877	1.1	0.429 (0.261)	16.40 (3.23)	0.010 (0.006)	200 (93)	67 (20)	28.82 (97.60)
7.1 mph (11.4 km/h)										
355.22 (264.89)	18983 (84.44)	7.02 (11.30)	1898	1.0	0.434 (0.264)	16.20 (3.19)	0.011 (0.006)	203 (95)	72 (22)	28.79 (97.49)
7.8 mph (12.6 km/h)										
349.82 (260.86)	16889 (75.13)	7.77 (12.50)	1886	0.8	0.434 (0.264)	16.19 (3.19)	0.010 (0.006)	203 (95)	71 (22)	28.79 (97.49)
8.7 mph (14.0 km/h)										
351.61 (262.20)	15296 (68.04)	8.62 (13.87)	1894	0.8	0.441 (0.268)	15.95 (3.14)	0.011 (0.007)	204 (95)	71 (21)	28.79 (97.49)

DRAWBAR PERFORMANCE
(Unballasted at 1850 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)
283.17 (211.16)	47513 (211.35)	2.24 (3.60)	2145	12.7	1st Gear 0.570 (0.347)	12.35 (2.43)	0.012 (0.007)	197 (91)	74 (23)	28.52 (96.58)
320.42 (238.93)	42050 (187.05)	2.86 (4.59)	2100	7.3	2nd Gear 0.509 (0.310)	13.81 (2.72)	0.011 (0.007)	201 (94)	74 (23)	28.53 (96.61)
339.55 (253.20)	40975 (182.27)	3.11 (5.01)	2064	7.2	3rd Gear 0.490 (0.298)	14.36 (2.83)	0.012 (0.007)	203 (95)	75 (24)	28.53 (96.61)
371.61 (277.11)	40195 (178.80)	3.47 (5.58)	2014	5.2	4th Gear 0.468 (0.285)	15.03 (2.96)	0.011 (0.007)	194 (90)	55 (13)	28.82 (97.60)
385.94 (287.80)	39038 (173.65)	3.71 (5.97)	1949	4.8	5th Gear 0.454 (0.276)	15.48 (3.05)	0.010 (0.006)	195 (91)	55 (13)	28.81 (97.56)
395.24 (294.73)	37415 (166.43)	3.97 (6.38)	1850	4.1	6th Gear 0.442 (0.269)	15.91 (3.13)	0.009 (0.005)	199 (93)	55 (13)	28.81 (97.56)
404.04 (301.29)	34229 (152.26)	4.43 (7.12)	1850	3.1	7th Gear 0.431 (0.262)	16.30 (3.21)	0.009 (0.006)	199 (93)	55 (13)	28.81 (97.56)
408.19 (304.38)	30890 (137.41)	4.96 (7.97)	1850	2.4	8th Gear 0.426 (0.259)	16.52 (3.25)	0.009 (0.005)	199 (93)	55 (13)	28.80 (97.53)
403.28 (300.72)	27437 (122.04)	5.51 (8.87)	1850	2.0	9th Gear 0.425 (0.258)	16.55 (3.26)	0.009 (0.006)	216 (102)	74 (24)	28.77 (97.43)
409.23 (305.16)	24958 (111.02)	6.15 (9.90)	1850	1.6	10th Gear 0.422 (0.257)	16.66 (3.28)	0.009 (0.006)	212 (100)	74 (23)	28.78 (97.46)
407.83 (304.12)	22446 (99.84)	6.82 (10.97)	1850	1.4	11th Gear 0.424 (0.258)	16.59 (3.27)	0.008 (0.005)	213 (100)	73 (23)	28.79 (97.49)
405.26 (302.20)	20005 (88.99)	7.60 (12.23)	1850	1.1	12th Gear 0.423 (0.257)	16.62 (3.27)	0.009 (0.005)	215 (102)	73 (23)	28.79 (97.49)
398.55 (297.20)	17734 (78.88)	8.43 (13.57)	1851	0.9	13th Gear 0.429 (0.261)	16.39 (3.23)	0.009 (0.005)	216 (102)	72 (22)	28.78 (97.46)

Lugging ability in 11th gear

Crankshaft speed rpm	2100	2000	1901	1850	1700	1600	1400	1100
Pull-lbs (kN)	16683 (74.21)	20076 (89.30)	21864 (97.26)	22581 (100.45)	24194 (107.62)	24965 (111.05)	24489 (108.93)	22915 (101.93)
Increase in pull%	0	20	31	35	45	50	47	37
Power-Hp (kW)	345.85 (257.90)	395.50 (294.92)	408.62 (304.71)	410.58 (306.17)	403.51 (300.90)	391.58 (292.00)	336.23 (250.73)	247.73 (184.73)
Speed-mpH (km/h)	7.78 (12.51)	7.39 (11.89)	7.01 (11.28)	6.82 (10.98)	6.25 (10.06)	5.88 (9.46)	5.15 (8.29)	4.05 (6.52)
Slip %	0.8	1.1	1.2	1.3	1.4	1.5	1.5	1.3

HYDRAULIC PERFORMANCE

CATEGORY: 4N/4

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range:

Category 4N lift cylinders
15410 lbs(68.5 kN) (1 x 90 mm and 1x100 mm)
20679 lbs(92.0 kN) (2 x 110 mm)

Category 4
15346 lbs(68.3 kN) (1 x 90 mm and 1x100 mm)
20526 lbs(91.3 kN) (2 x 110 mm)

Base pump Tandem pump
three outlet sets combined

i) Sustained pressure at compensator cutoff:

2861 psi (197 bar) 2910 psi (201 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed:

62.0 GPM (234.5 l/min) 56.8 GPM (214.9 l/min)

Combined flow:

118.8 GPM (449.4 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

61.2 GPM (231.8 l/min) 57.2 GPM (216.3 l/min)

Delivery pressure:

2565 psi (177 bar) 2458 psi (169 bar)

Power:

91.6 HP (68.3 kW) 82.0 HP (61.1 kW)

single outlet set

3/4" couplers 1/2" couplers

i) Sustained pressure at compensator cutoff:

2856 psi (197 bar) 2907 psi (200 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed:

43.1 GPM (163.2 l/min) 37.5 GPM (142.0 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

42.5 GPM (160.9 l/min) 35.2 GPM (133.1 l/min)

Delivery pressure:

2226 psi (153 bar) 2314 psi (160 bar)

Power:

55.2 HP (41.2 kW) 47.5 HP (35.4 kW)

Category 4N

inch

mm

Category 4

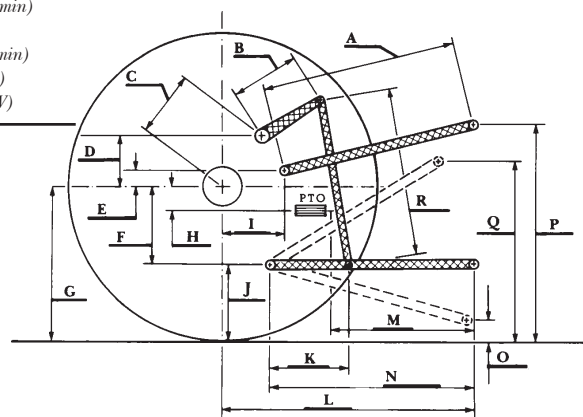
inch

mm

A	31.4	798	30.1	765
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	580	22.8	580
N	51.5	1308	51.5	1308
O	9.0	230	9.0	230
P	49.8	1266	49.8	1266
Q	40.3	1023	40.1	1018
R	50.2	1275	50.4	1280

*L' to Quick Attach ends

HITCH DIMENSIONS AS TESTED—NO LOAD



JOHN DEERE 9470RT DIESEL

Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln