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2021

Test 2238: John Deere 7R 350 IVT

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2238-SUMMARY 1190

JOHN DEERE 7R 350 DIESEL

INFINITELY VARIABLE TRANSMISSION

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						
Rated Engine Speed—(PTO speed—1077 rpm)						
271.72 (202.62)	2100	14.40 (54.52)	0.371 (0.226)	18.87 (3.72)	0.71 (2.67)	Fuel used during active exhaust regeneration-1.27 gal (4.79 l) (see note 1, p.2)
Standard Power Take-off Speed (1000 rpm)						
297.16 (221.59)	1950	15.28 (57.83)	0.360 (0.219)	19.45 (3.83)	0.69 (2.61)	
Maximum Power (1 hour)						
304.59 (227.13)	1750	15.30 (57.92)	0.352 (0.214)	19.91 (3.92)	0.68 (2.58)	

VARYING POWER AND FUEL CONSUMPTION

271.72 (202.62)	2100	14.40 (54.52)	0.371 (0.226)	18.87 (3.72)	0.71 (2.67)	Air temperature
239.57 (178.65)	2181	13.15 (49.76)	0.384 (0.234)	18.22 (3.59)	0.65 (2.48)	72°F (22°C)
180.54 (134.62)	2190	10.57 (40.01)	0.410 (0.249)	17.08 (3.36)	0.45 (1.70)	Relative humidity
120.76 (90.05)	2201	8.14 (30.82)	0.472 (0.287)	14.83 (2.92)	0.24 (0.92)	28%
60.35 (45.00)	2210	5.95 (22.52)	0.690 (0.420)	10.14 (2.00)	0.15 (0.58)	Barometer
1.35 (1.01)	2219	4.53 (17.15)	23.515 (14.304)	0.30 (0.06)	0.18 (0.69)	28.81" Hg (97.58 kPa)

Maximum torque - 983 lb.-ft. (1332 Nm) at 1551 rpm

Maximum torque rise - 44.6%

Torque rise at 1680 engine rpm - 39%

Power increase at 1750 engine rpm - 12.1%

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)	D.E.F. Consumption lb/hp.hr (kW.h/l)	D.E.F. Consumption cool- ing (kg/kW.h)	Temp. °F(°C) Air dry bulb	Barom. inch Hg (kPa)	
Power at Rated Engine Speed—6.2 mph (10.0 km/h)-Manual mode										
263.73 (196.66)	18031 (80.20)	5.49 (8.83)	2100	3.8	0.425 (0.259)	16.45 (3.24)	0.025 (0.015)	219 (104)	47 (8)	28.44 (96.31)
75% of Pull at Rated Engine Speed—6.2 mph (10.0 km/h)-Manual mode										
206.24 (153.79)	13512 (60.10)	5.73 (9.21)	2160	2.8	0.447 (0.272)	15.64 (3.08)	0.031 (0.019)	219 (104)	58 (14)	28.75 (97.36)
50% of Pull at Rated Engine Speed—6.2 mph (10.0 km/h)-Manual mode										
139.21 (103.81)	8973 (39.91)	5.82 (9.37)	2172	1.8	0.499 (0.304)	14.01 (2.76)	0.030 (0.018)	218 (103)	58 (14)	28.76 (97.39)
75% of Pull at Reduced Engine Speed—6.0 mph (9.6 km/h)-Auto mode										
206.70 (154.13)	13441 (59.79)	5.77 (9.29)	1549	2.9	0.402 (0.245)	17.39 (3.43)	0.017 (0.011)	219 (104)	59 (15)	28.76 (97.39)
50% of Pull at Reduced Engine Speed—6.0 mph (9.6 km/h)-Auto mode										
139.37 (103.92)	9009 (40.07)	5.80 (9.33)	1412	1.8	0.415 (0.253)	16.85 (3.32)	0.015 (0.009)	217 (103)	58 (14)	28.76 (97.39)

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

Dates of tests: April 9 - 27, 2021

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)** 0.8404 **Fuel weight** 6.998 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** CK-4 **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere Hy-Gard fluid **Total time engine was operated:** 24.0 hours

ENGINE: Make John Deere **Diesel Type** six cylinder vertical with turbocharger, air to air aftercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** *RG6090U096528* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.661" x 5.354" (118.4 mm x 136.0 mm) **Compression ratio** 16.0 to 1 **Displacement** 548 cu in (8984 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** thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: Stationary PTO operations (310 engine hp) 94.4 - 102.0 lb/h (42.8 - 46.3 kg/h) Drawbar operations (350 engine hp) 106.5 - 114.9 lb/h (48.3 - 52.1 kg/h) **High idle:** 2190 - 2220 rpm **Turbo boost:** nominal 26.1 - 28.3 psi (180 - 195 kPa) as measured 27.5 psi (190 kPa)

CHASSIS: Type front wheel assist with duals **Serial No.** *1RW7350STMD120340* **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** Infinitely variable with two mechanical ranges and automatic shifting between ranges **Nominal travel speeds mph (km/h)** forward - 0 - 26.1 mph, (0 - 42 km/h) reverse - 0 - 12.4 mph (0 - 20 km/h) **Clutch** a foot pedal controls the hydrostatic oil flow **Brakes** wet multiple disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED

MANUAL MODE - 2100 ENGINE RPM
DRAWBAR POWER AT SELECTED TRAVEL SPEED SETTINGS

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)
3.7 mph (6.0 km/h)										
212.77 (158.66)	26618 (118.40)	3.00 (4.83)	2154	14.6	0.494 (0.300)	14.17 (2.79)	0.032 (0.020)	219 (104)	43 (6)	29.00 (98.21)
4.2 mph (6.8 km/h)										
244.17 (182.07)	25441 (113.17)	3.60 (5.79)	2123	8.4	0.447 (0.272)	15.64 (3.08)	0.029 (0.017)	219 (104)	44 (6)	29.00 (98.21)
4.7 mph (7.6 km/h)										
253.36 (188.93)	23475 (104.42)	4.05 (6.51)	2100	6.8	0.443 (0.270)	15.78 (3.11)	0.030 (0.018)	218 (103)	54 (12)	28.78 (97.46)
5.1 mph (8.2 km/h)										
257.99 (192.38)	21856 (97.22)	4.43 (7.12)	2100	5.3	0.436 (0.265)	16.04 (3.16)	0.029 (0.017)	218 (103)	52 (11)	28.79 (97.49)
5.6 mph (9.0 km/h)										
258.69 (192.91)	19856 (88.32)	4.89 (7.86)	2100	4.8	0.434 (0.264)	16.14 (3.18)	0.030 (0.018)	218 (103)	55 (13)	28.77 (97.43)
6.2 mph (10.0 km/h)										
263.73 (196.66)	18031 (80.20)	5.49 (8.83)	2100	3.8	0.425 (0.259)	16.45 (3.24)	0.025 (0.015)	219 (104)	47 (8)	28.44 (96.31)
6.8 mph (11.0 km/h)										
261.01 (194.64)	16067 (71.47)	6.10 (9.81)	2100	3.5	0.432 (0.263)	16.21 (3.19)	0.026 (0.016)	219 (104)	45 (7)	28.43 (96.26)
7.5 mph (12.0 km/h)										
264.96 (197.58)	14958 (66.53)	6.64 (10.69)	2100	3.1	0.426 (0.259)	16.44 (3.24)	0.026 (0.016)	218 (103)	48 (9)	28.44 (96.31)
8.1 mph (13.0 km/h)										
264.63 (197.33)	13713 (61.00)	7.24 (11.65)	2100	2.8	0.424 (0.258)	16.49 (3.25)	0.027 (0.016)	218 (103)	51 (11)	28.45 (96.34)
8.7 mph (14.0 km/h)										
265.95 (198.32)	12710 (56.53)	7.85 (12.63)	2100	2.5	0.422 (0.256)	16.60 (3.27)	0.026 (0.016)	218 (103)	53 (12)	28.45 (96.34)
9.3 mph (15.0 km/h)										
265.64 (198.08)	11892 (52.90)	8.38 (13.48)	2100	2.3	0.423 (0.258)	16.53 (3.26)	0.025 (0.015)	218 (103)	55 (13)	28.45 (96.34)

Power take-off 1000 rpm at 1950 engine rpm
Unladen tractor mass 25955 lb (11773 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: The manufacturer declares that the average time between active regenerations is 40 hours. A 1% power increase was observed during the active regeneration.

NOTE 2: In stationary PTO operation, this model operates in a derated power mode.

NOTE 3: The John Deere 7R 350 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. This tractor fell 1.2% 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.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2238**, Nebraska Summary 1190, October 19, 2021.

Roger M. Hoy
Director

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

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load at 4.7 mph (7.6 km/h) engine speed - 2200 rpm	68.8	68.8
At no load at 4.7 mph (7.6 km/h) Auto mode - engine speed - 1200 rpm	61.3	61.1
At no load at 4.7 mph (7.6 km/h) Custom mode - engine speed - 900 rpm	59.7	59.6
Transport speed - no load - manual mode		71.0
Transport speed - no load - Auto mode		69.3
Transport speed - no load - Custom mode		69.3
Bystander		85.0

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 480/80R50;***;12(85)
Two 420/85R34;***;17(110)
21.0 in (535 mm)
16880 lb (7656 kg)
9250 lb (4196 kg)
26130 lb (11852 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 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)
4.0 mph (6.4 km/h)										
244.27 (182.15)	25016 (111.27)	3.67 (5.90)	1741	7.6	0.425 (0.259)	16.45 (3.24)	0.026 (0.016)	218 (103)	44 (7)	29.00 (98.21)
4.3 mph (7.0 km/h)										
250.10 (186.50)	23417 (104.16)	4.01 (6.45)	1761	6.7	0.423 (0.258)	16.52 (3.26)	0.029 (0.017)	218 (103)	54 (12)	28.78 (97.46)
4.7 mph (7.6 km/h)										
256.86 (191.54)	21708 (96.56)	4.44 (7.15)	1784	5.5	0.419 (0.255)	16.71 (3.29)	0.028 (0.017)	218 (103)	53 (12)	28.78 (97.46)
5.1 mph (8.2 km/h)										
257.03 (191.67)	20009 (89.00)	4.82 (7.75)	1799	4.7	0.418 (0.254)	16.74 (3.30)	0.028 (0.017)	219 (104)	55 (13)	28.77 (97.43)
5.7 mph (9.2 km/h)										
263.64 (196.60)	18208 (80.99)	5.43 (8.74)	1813	4.0	0.415 (0.252)	16.88 (3.33)	0.025 (0.015)	218 (103)	47 (8)	28.44 (96.31)
6.3 mph (10.2 km/h)										
260.69 (194.39)	16082 (71.53)	6.08 (9.78)	1825	3.3	0.413 (0.251)	16.95 (3.34)	0.024 (0.015)	219 (104)	46 (8)	28.43 (96.28)
7.0 mph (11.2 km/h)										
264.58 (197.30)	14780 (65.74)	6.72 (10.81)	1774	3.0	0.403 (0.245)	17.35 (3.42)	0.023 (0.014)	217 (103)	49 (9)	28.44 (96.31)
7.5 mph (12.0 km/h)										
263.83 (196.73)	13760 (61.21)	7.19 (11.57)	1776	2.8	0.402 (0.245)	17.41 (3.43)	0.025 (0.015)	218 (103)	52 (11)	28.45 (96.34)
8.1 mph (13.0 km/h)										
265.43 (197.93)	12731 (56.63)	7.82 (12.59)	1787	2.5	0.400 (0.243)	17.50 (3.45)	0.024 (0.015)	218 (103)	53 (12)	28.45 (96.34)
8.7 mph (14.0 km/h)										
265.36 (197.88)	11792 (52.45)	8.44 (13.58)	1801	2.3	0.404 (0.246)	17.33 (3.41)	0.023 (0.014)	218 (103)	56 (13)	28.45 (96.34)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED
MANUAL MODE - 1850 ENGINE RPM
MAXIMUM POWER AT SELECTED TRAVEL SPEED SETTINGS

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 dry bulb	Barom. inch Hg (kPa)	
3.7 mph (6.0 km/h)										
215.13 (160.42)	26523 (117.98)	3.05 (4.90)	2154	13.3	0.485 (0.295)	14.42 (2.84)	0.031 (0.019)	219 (104)	43 (6)	29.00 (98.21)
4.2 mph (6.8 km/h)										
243.99 (181.94)	25438 (113.15)	3.60 (5.79)	2126	8.5	0.451 (0.274)	15.52 (3.06)	0.030 (0.018)	219 (104)	43 (6)	29.00 (98.21)
4.7 mph (7.6 km/h)										
262.26 (195.57)	24845 (110.51)	3.96 (6.37)	2062	7.3	0.438 (0.267)	15.96 (3.14)	0.027 (0.017)	219 (104)	44 (7)	29.00 (98.21)
5.1 mph (8.2 km/h)										
274.09 (204.39)	24538 (109.15)	4.19 (6.74)	2016	6.9	0.433 (0.263)	16.17 (3.19)	0.026 (0.016)	219 (104)	45 (7)	29.00 (98.21)
5.6 mph (9.0 km/h)										
283.95 (211.74)	23622 (105.08)	4.51 (7.26)	1954	6.4	0.428 (0.261)	16.33 (3.22)	0.028 (0.017)	219 (104)	45 (7)	29.00 (98.21)
6.2 mph (10.0 km/h)										
289.64 (215.98)	21975 (97.75)	4.95 (7.96)	1921	5.6	0.421 (0.256)	16.61 (3.27)	0.028 (0.017)	219 (104)	45 (7)	29.00 (98.21)
6.8 mph (11.0 km/h)										
289.36 (215.78)	20537 (91.35)	5.29 (8.51)	1850	5.0	0.420 (0.256)	16.65 (3.28)	0.027 (0.017)	218 (103)	46 (8)	29.00 (98.21)
7.5 mph (12.0 km/h)										
293.41 (218.80)	19029 (84.64)	5.79 (9.31)	1850	4.5	0.416 (0.253)	16.84 (3.32)	0.027 (0.017)	218 (103)	46 (8)	29.00 (98.21)
8.1 mph (13.0 km/h)										
297.00 (221.47)	17659 (78.55)	6.31 (10.15)	1850	4.0	0.410 (0.249)	17.06 (3.36)	0.027 (0.016)	219 (104)	47 (8)	29.00 (98.21)
8.7 mph (14.0 km/h)										
299.59 (223.40)	16484 (73.32)	6.82 (10.97)	1850	3.7	0.406 (0.247)	17.23 (3.39)	0.027 (0.016)	219 (104)	47 (8)	28.99 (98.17)
9.3 mph (15.0 km/h)										
302.09 (225.27)	15543 (69.14)	7.29 (11.73)	1850	3.4	0.402 (0.245)	17.41 (3.43)	0.026 (0.016)	218 (103)	47 (8)	28.09 (98.17)
9.9 mph (16.0 km/h)										
303.09 (226.01)	14568 (64.80)	7.80 (12.55)	1850	3.2	0.402 (0.245)	17.40 (3.43)	0.026 (0.016)	218 (103)	48 (9)	28.98 (98.14)
10.6 mph (17.0 km/h)										
305.03 (227.46)	13723 (61.04)	8.34 (13.41)	1849	3.0	0.401 (0.244)	17.47 (3.44)	0.026 (0.016)	219 (104)	48 (9)	28.99 (98.15)

Lugging ability from speed setting 9.3 mph (15.0 km/h)

Crankshaft speed rpm	2100	2000	1851	1750	1600	1500	1401	1300
Pull-lbs (kN)	11896 (52.91)	13707 (60.97)	15205 (67.63)	16015 (71.24)	16538 (73.56)	16584 (73.77)	16612 (73.89)	16338 (72.68)
Increase in pull%	0	15	28	35	39	39	40	37
Power-Hp (kW)	265.26 (197.80)	290.29 (216.47)	297.75 (222.03)	295.26 (220.18)	278.38 (207.59)	261.40 (194.92)	244.88 (182.61)	223.44 (166.62)
Speed-mph (km/h)	8.37 (13.46)	7.94 (12.78)	7.35 (11.82)	6.91 (11.12)	6.31 (10.15)	5.91 (9.51)	5.53 (8.90)	5.13 (8.26)
Slip %	2.3	2.8	3.2	3.4	3.6	3.6	3.6	3.5

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
 2853 psi (197 bar) 2931 psi (202 bar)
three outlet sets combined

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

44.9 GPM (169.9 l/min) 58.3 GPM (220.7 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

44.7 GPM (169.3 l/min) 57.5 GPM (217.6 l/min)

Delivery pressure:

2555 psi (176 bar) 2571 psi (177 bar)

Power:

66.7 HP (49.7 kW) 86.2 HP (64.3 kW)

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

36.5 GPM (138.3 l/min) 36.4 GPM (137.9 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

35.4 GPM (133.9 l/min) 35.4 GPM (134.0 l/min)

Delivery pressure:

2258 psi (156 bar) 2244 psi (155 bar)

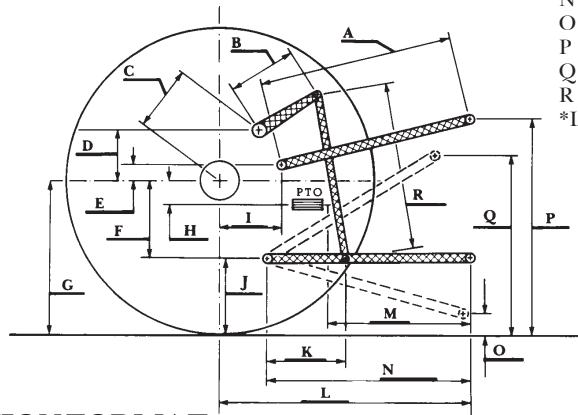
Power:

46.6 HP (34.7 kW) 46.4 HP (34.6 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 2238 for John Deere 7R 350 IVT Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



JOHN DEERE 7R 350 DIESEL

Institute of Agriculture and Natural Resources
 University of Nebraska–Lincoln