# **NEBRASKA TRACTOR TEST 2191** JOHN DEERE 5090R DIESEL **16 SPEED**

### Open center hydraulic system

### **POWER TAKE-OFF PERFORMANCE**

Power HP	Crank shaft	Diesel	on		D.E.F.	ntion
( <i>kW</i> )	speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/ga (kW.h/l)	l Gal/hr (l/h)	Mean Atmospheric Conditions
	MA	XIMUM	POWER	AND F	UEL (	CONSUMPTION
		Rated	Engine Spe	eed—(PTC	) speed-	—566 rpm)
77.17 (57.55)	2201	4.84 (18.33)	0.441 (0.268)	15.94 (3.14)	0.16 (0.59)	Fuel used during active exhaus regeneration-0.58 gal (2.18 l)
		~ .		1 00 0	1/200	(see note 1, p.2)
		Standar	d Power Ta	ke-off Spe	ed(539	rpm)
81.89 (61.07)	2100	4.88	(0.255)	16.77	0.17	
(01.07)		(10.17)	(0.255)	(5.50)	(0.05)	
		Maxin	um Power	(1 hour)		
89.61	1902	4.96	(0.389)	18.06	0.22	
(00.82)		(10.70)	(0.290)	(0.90)	(0.85)	
RYING	POWE	R AND F	UEL CON	SUMPT	ION	
77.17	2201	4.84	0.441	15.94	0.16	Airtemperature
(57.55)		(18.33)	(0.268)	(3.14)	(0.59)	
67.66	2269	4.52	0.469	14.96	0.13	76°F(25°C)
(50.45)		(17.12)	(0.286)	(2.95)	(0.50)	
50.88	2279	3.77	0.520	13.50	0.10	<b>Relative humidity</b>
(37.94)		(14.26)	(0.316)	(2.66)	(0.36)	
34.11	2293	3.13	0.644	10.91	0.05	47%
(25.44)		(11.84)	(0.392)	(2.15)	(0.18)	
17.18	2309	2.43	0.994	7.06	0.06	Barometer
		(9.21)	(0.605)	(1.39)	(0.24)	
(12.81)						
( <i>12.81</i> ) 1.08	2321	1.85	11.961	0.59	0.04	28.04" Hg(94.95 kPa)

Maximum torque rise - 46.1%

Torque rise at 1762 engine rpm - 40%

Power increase at 1902 engine rpm - 16.1%

	Front Wheel Drive	
TRACTOR SOUND LEVEL WITH CAB	Engaged dB(A)	Disengaged dB(A)
At no load in 7th (B3) gear	73.6	73.4
Transport in 16th (D4) gear		76.3
Bystander in 16th (D4) gear		82.8

Horizontal distances of drawbar hitch point behind rear wheel axis - 32.5"(825 mm), 34.4" (875 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

Two 16 9R30.\*\*.12(85) Two 11.2R24;\*\*;18(125) 16.0 in (405 mm) 5900 lb (2676 kg) 3635 lb (1649 kg) 9535 lb (4325 kg)

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

Dates of tests: April 13 - 24, 2018

Manufacturer: John Deere Commercial Products Inc., 700 Horizon South Parkway, Grovetown Ga. USA 30813

**CONSUMABLE Fluids, OIL and TIME: Fuel** No. 2 Diesel Specific gravity converted to 60°/ 60°F (15°/15°C) 0.8434 Fuel weight 7.023 lbs/gal (0.842 kg/l) Diesel Exhaust Fluid (DEF) 32% aqueous urea solution DEF weight 9.071 lbs/gal (1.087 kg/l) Oil SAE 10W30 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 9.5 hours

ENGINE: Make John Deere Diesel Type four cylinder vertical with turbocharger, air to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment Serial No. \*PE4045U057010\* Crankshaft lengthwise Rated engine speed 2200 Bore and stroke 4.19" x 5.00" (106.5 mm x 127.0 mm) Compression ratio 16.9 to 1 Displacement 276 cu in (4525 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 Fuel cooler radiator for return fuel Exhaust regenerative aftertreatment system consisting of DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) with an underhood muffler and vertical exhaust Cooling medium temperature control two thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel** rate: 32.4 - 35.1 lb/h (14.7 - 15.9 kg/h) High idle: 2300 - 2350 rpm Turbo boost: nominal 16.0 -18.9 psi (110 - 130 kPa) as measured 17.4 psi (120 kPa)

CHASSIS: Type front wheel assist Serial No. \*1LV5090RHHH400177\* Tread width rear 58.0" (1473 mm) to 71.6" (1819 mm) front 58.6" (1488 mm) to 81.5" (2070 mm) Wheelbase 88.6" (2250 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio Nominal travel speeds mph (km/h) first 1.29 (2.07) second 1.59 (2.56) third 1.97 (3.17) fourth 2.41 (3.88) fifth 2.98 (4.79) sixth 3.67 (5.91) seventh 4.55 (7.33) eighth 5.59 (8.99) ninth 5.76 (9.27) tenth 7.11 (11.45) eleventh 8.81 (14.18) twelfth 10.81 (17.40) thirteenth 12.89 (20.75) fourteenth 15.93 (25.63) fifteenth 19.73 (31.75) sixteenth 24.21 (38.96)

## HYDRAULIC PERFORMANCE

CATECORVII

Quick Attach: None	
OECD Static test	lift cylinders
Maximum force exerted through whole range:	7720 lbs (34.3 kN) (2 x 75 mm)
	8678 lbs (38.6 kN) (2 x 80 mm)
	single outlet set <u>two outlet sets combined</u>
i) Sustained pressure of the open relief valve:	2857 psi (197 bar) 2865 psi (198 bar)
ii) Pump delivery rate at minimum pressure	
and rated engine speed:	21.4 GPM (80.9 l/min) 21.3 GPM (80.6 l/min)
iii) Pump delivery rate at maximum	
hydraulic power:	21.2 GPM (80.4 l/min) 21.2 GPM (80.3 l/min)
Delivery pressure:	2464 psi (170 bar) 2618 psi (181 bar)
Power:	30.5 HP (22.8 kW) 32.4 HP (24.2 kW)

#### HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	26.4	670
В	14.1	358
С	17.7	449
D	15.0	380
E	14.4	365
F	8.8	223
G	31.3	795
Н	0.2	4
Ι	14.4	365
Ĭ	22.5	572
ĸ	17.5	444
L	41.7	1060
М	23.0	585
Ν	33.1	840
0	9.1	230
Р	46.5	1182
Q	38.4	975
Ř	32.3	820



## reverse 1.37 (2.21), 1.70 (2.73), 2.10 (3.38), 2.58 (4.15), 3.18 (5.11), 3.92 (6.31), 4.86 (7.82), 5.96 (9.59), 6.15 (9.89), 7.59 (12.22), 9.40 (15.13), 11.54 (18.57), 13.76 (22.15), 17.00 (27.35), 18.64 (30.00), 18.64 (30.00) electronically limited **Clutch** wet disc hydraulically actuated by foot pedal **Brakes** wet disc hydraulically actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2100 engine rpm, Economy PTO 540 rpm at 1645 engine rpm **Unladen tractor mass** 9360 lb (4246 kg)

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

**NOTE 1:** The manufacturer declares that the average time between active regenerations is 150 hours. A 2% power increase was observed during the active exhaust regeneration.

**NOTE 2:** The performance data on this report applies to tractors with an open center hydraulic system.

**REMARKS:** This tractor exceeded the 73 dB(A) sound power claim, with front drive engaged, by 14.8% (0.6 dB(A)) and with front drive disengaged by 9.6% (0.4 dB(A)). All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2191**, June 15, 2018.

Roger M. Hoy Director

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

## **RECOMMENDED CITATION FORMAT:**

NTTL.(2018). Nebraska tractor test 2191 for John Deere 5090R OC Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from http://tractortestlab.unl.edu

# Shiftable PTO Performance

## Economy mode 540 PTO rpm @1645 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	n lb/hp.hr (kg/kW.h)	Hp.hr/ga (kW.h/l)	D.E.F. Consumpti l Gal/hr (l/h)
81.86	1645	4.37	0.375	18.73	0.19
(61.04)		(16.55)	( $0.228$ )	(3.69)	(0.71)
61.44	1651	3.38	0.386	18.20	0.14
(45.82)		(12.78)	(0.235)	(3.58)	(0.52)
41.04	1651	2.50	0.427	16.44	0.09
(30.60)		(9.45)	(0.260)	(3.24)	(0.35)
20.46	1641	1.74	0.598	11.74	0.03
(15.25)		(6.59)	(0.364)	(2.31)	(0.11)
0.95	1641	1.09	8.096	0.87	0.04
(0.71)		(4.14)	(4.925)	(0.17)	(0.14)

## Normal mode 540 PTO rpm @2100 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	n lb/hp.hr (kg/kW.h)	Hp.hr/ga (kW.h/l)	D.E.F. Consumptio l Gal/hr ( <i>l/h</i> )
81.86 (61.04)	2100	4.86 (18.39)	$\begin{array}{c} 0.417 \\ (0.254) \end{array}$	16.85 (3.32)	0.18 (0.68)
61.42 (45.80)	2098	3.95 (14.97)	$\begin{array}{c} 0.452 \\ (0.275) \end{array}$	15.53 (3.06)	0.13 (0.50)
40.97	2097	3.10	0.532	13.21	0.06
(30.55)		(11.74)	(0.323)	(2.60)	(0.22)
20.48	2099	2.21	0.757	9.27	0.03
(15.27)		(8.36)	(0.461)	(1.83)	(0.11)
0.93	2097	1.60	12.133	0.58	0.01
(0.69)		(6.07)	(7. <i>380</i> )	(0.11)	(0.02)



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