NEBRASKA TRACTOR TEST 2210
JOHN DEERE 5090E DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Diesel Consumption Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	D.E.F. Consumption Hp.hr/gal *(kW.h/l)*	D.E.F. Consumption Gal/hr *(l/h)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—544 rpm)						
76.78 *(57.26)*	2403	5.07 *(19.20)*	0.462 *(0.281)*	15.14 *(2.98)*	0.18 *(0.67)*	Fuel used during active exhaust regeneration-0.60 gal *(2.28 l)* (see note 1, p.2)
Standard Power Take-off Speed(540rpm)						
77.93 *(58.11)*	2385	5.08 *(19.24)*	0.456 *(0.278)*	15.33 *(3.02)*	0.18 *(0.69)*	
Maximum Power (1 hour)						
80.75 *(60.21)*	2199	4.84 *(18.34)*	0.420 *(0.255)*	16.67 *(3.28)*	0.20 *(0.75)*	
VARYING POWER AND FUEL CONSUMPTION						
76.78 *(57.26)*	2403	5.07 *(19.20)*	0.462 *(0.281)*	15.14 *(2.98)*	0.18 *(0.67)*	Air temperature
66.23 *(49.39)*	2439	4.64 *(17.57)*	0.490 *(0.298)*	14.27 *(2.81)*	0.16 *(0.61)*	71°F *(22°C)*
50.14 *(37.39)*	2461	4.00 *(15.14)*	0.558 *(0.340)*	12.53 *(2.47)*	0.12 *(0.47)*	Relative humidity
33.80 *(25.20)*	2491	3.30 *(12.47)*	0.682 *(0.415)*	10.26 *(2.02)*	0.09 *(0.36)*	30%
16.88 *(12.58)*	2500	2.61 *(9.89)*	1.083 *(0.659)*	6.46 *(1.27)*	0.10 *(0.36)*	Barometer
1.26 *(0.94)*	2500	2.02 *(7.66)*	11.206 *(6.816)*	0.62 *(0.12)*	0.02 *(0.09)*	28.89" Hg *(97.84 kPa)*

Maximum torque - 232 lb.-ft. *(314 Nm)* at 1502 rpm
Maximum torque rise - 38.1%
Torque rise at 1921 engine rpm - 30%
Power increase at 2199 engine rpm- 5.2%

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Engaged dB(A)	Front Wheel Drive Disengaged dB(A)
At no load in 6th (B2) gear	80.0	79.9
Transport in 12th (C4) gear		82.2
Bystander in 12th (C4) gear		81.3

Horizontal distances of drawbar hitch point behind rear wheel axis - 24.2"*(615 mm)*, 30.8"*(782 mm)*, 32.8"*(833 mm)*

TIRES AND WEIGHT	Tested without ballast
Rear tires–No., size, ply & psi *(kPa)*	Two 18.4-30;8;12 *(85)*
Front tires–No., size, ply & psi *(kPa)*	Two 12.4-24;8;16 *(110)*
Height of drawbar	18.0 in *(455 mm)*
Static weight with operator– Rear	4655 lb *(2112 kg)*
– Front	3495 lb *(1585 kg)*
– Total	8150 lb *(3697 kg)*

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln Nebraska 68583-0832
Dates of tests: May 2 - 6, 2019

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)*** 0.8404 **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** 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.** *PE4045U078069* **Crankshaft** lengthwise **Rated engine speed** 2400 **Bore and stroke** 4.19" x 5.00" *(106.5 mm x 127.0 mm)* **Compression ratio** 19.0 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: 34.6 - 38.1 lb/h *(15.7 - 17.3 kg/h)* **High idle:** 2475 - 2525 rpm **Turbo boost:** nominal 16.0 - 18.9 psi *(110 - 130 kPa)* as measured 18.5 psi *(128 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *1LV5090EJJK400503* **Tread width** rear 59.5" *(1512 mm)* to 71.7" *(1820 mm)* front 54.9" *(1395 mm)* to 78.6" *(1997 mm)* **Wheelbase** 92.5" *(2350 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph *(km/h)*** first 1.06 *(1.72)* second 1.45 *(2.34)* third 1.99 *(3.20)* fourth 2.66 *(4.28)* fifth 3.08 *(4.96)* sixth 4.19 *(6.75)* seventh 5.72 *(9.21)* eighth 7.67 *(12.34)* ninth 8.91 *(14.34)* tenth 12.12 *(19.51)* eleventh 16.55 *(26.64)* twelfth 22.13 *(35.62)*

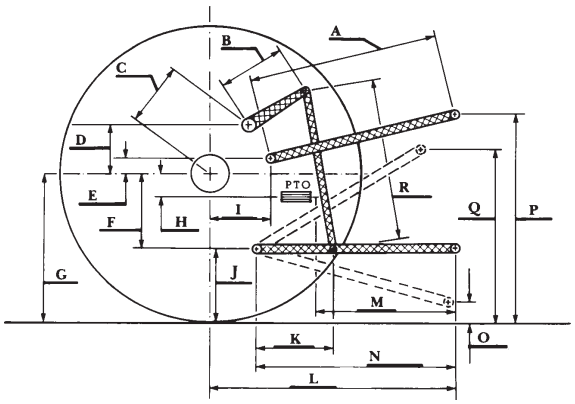
HYDRAULIC PERFORMANCE

CATEGORY: II
Quick Attach: None
OECD Static test

Maximum force exerted through whole range:	3213 lbs *(14.3 kN)*	
	single outlet set	two outlet sets combined
i) Sustained pressure of the open relief valve:	2924 psi *(202 bar)*	2931 psi *(202 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	16.1 GPM *(61.0 l/min)*	16.3 GPM *(61.6 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	14.1 GPM *(53.4 l/min)*	14.2 GPM *(53.7 l/min)*
Delivery pressure:	2624 psi *(181 bar)*	2687 psi *(185 bar)*
Power:	21.6 HP *(16.1 kW)*	22.2 HP *(16.6 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	24.1	*613*
B	11.0	*280*
C	14.0	*356*
D	12.2	*311*
E	11.2	*284*
F	6.5	*165*
G	27.4	*695*
H	0.2	*4*
I	15.1	*384*
J	20.9	*530*
K	16.7	*424*
L	39.2	*996*
M	22.4	*570*
N	32.9	*836*
O	8.0	*203*
P	44.9	*1140*
Q	34.0	*864*
R	20.8	*527*



reverse 1.17 *(1.88)*, 1.58 *(2.55)*, 2.17 *(3.49)*, 2.91 *(4.67)*, 3.36 *(5.41)*, 4.57 *(7.36)*, 6.24 *(10.05)*, 8.36 *(13.46)*, 9.72 *(15.64)*, 13.23 *(21.29)*, 18.06 *(29.07)*, 24.20 *(38.94)* **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 2378 engine rpm, Economy PTO 540 rpm at 1721 engine rpm **Unladen tractor mass** 7975 lb *(3617 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 decrease was observed during the active exhaust regeneration.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor exceeded the 78 dB(A) sound power claim by 58.5% (2.0 dB(A)).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2210**, July 26, 2019.

Roger M. Hoy
Director

M.F. Kocher
P.J. Jasa
S.K. Pitla
Board of Tractor Test Engineers

Shiftable PTO Performance

Economy mode
540 PTO rpm @1721 engine rpm

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)*
74.54 *(55.58)*	1721	3.95 *(14.96)*	0.371 *(0.226)*	18.86 *(3.72)*	0.23 *(0.86)*
55.99 *(41.75)*	1719	3.17 *(11.99)*	0.396 *(0.241)*	17.67 *(3.48)*	0.14 *(0.51)*
37.34 *(27.84)*	1722	2.33 *(8.82)*	0.437 *(0.266)*	16.03 *(3.16)*	0.09 *(0.33)*
18.56 *(13.84)*	1722	1.66 *(6.27)*	0.624 *(0.380)*	11.21 *(2.21)*	0.01 *(0.02)*
1.20 *(0.90)*	1723	1.10 *(4.16)*	6.411 *(3.900)*	1.09 *(0.22)*	0.01 *(0.02)*

Normal mode
540 PTO rpm @2378 engine rpm

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)*
74.40 *(55.48)*	2378	4.89 *(18.53)*	0.460 *(0.280)*	15.20 *(2.99)*	0.17 *(0.63)*
55.94 *(41.72)*	2391	4.10 *(15.51)*	0.512 *(0.312)*	13.66 *(2.69)*	0.13 *(0.49)*
37.27 *(27.80)*	2382	3.31 *(12.53)*	0.622 *(0.378)*	11.26 *(2.22)*	0.09 *(0.33)*
18.59 *(13.86)*	2385	2.49 *(9.44)*	0.939 *(0.571)*	7.46 *(1.47)*	0.07 *(0.28)*
1.19 *(0.89)*	2385	1.82 *(6.89)*	10.665 *(6.488)*	0.66 *(0.13)*	0.01 *(0.05)*

RECOMMENDED CITATION FORMAT:
NTTL.(2019). Nebraska Tractor test 2210 for John Deere 5090E Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from http://tractortestlab.unl.edu

JOHN DEERE 5090E DIESEL

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln