2018

Test 2204: John Deere 5090M

Nebraska Tractor Test Laboratory
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NEBRASKA TRACTOR TEST 2204
JOHN DEERE 5090M DIESEL
16 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—566 rpm)						
75.61 *(56.38)*	2201	4.84 *(18.32)*	0.448 *(0.272)*	15.63 *(3.08)*	0.17 *(0.63)*	Fuel used during active exhaust regeneration-0.56 gal *(2.11 l)* (see note 1, p.2)
Standard Power Take-off Speed(540rpm)						
77.84 *(58.04)*	2100	4.76 *(18.03)*	0.428 *(0.261)*	16.34 *(3.22)*	0.17 *(0.63)*	
Maximum Power (1 hour)						
83.74 *(62.45)*	1851	4.65 *(17.61)*	0.389 *(0.236)*	18.00 *(3.55)*	0.21 *(0.80)*	
VARYING POWER AND FUEL CONSUMPTION						
75.61 *(56.38)*	2201	4.84 *(18.32)*	0.448 *(0.272)*	15.63 *(3.08)*	0.17 *(0.63)*	Air temperature
65.55 *(48.88)*	2244	4.47 *(16.92)*	0.477 *(0.290)*	14.66 *(2.89)*	0.13 *(0.51)*	71°F *(22°C)*
49.83 *(37.16)*	2270	3.88 *(14.69)*	0.545 *(0.331)*	12.84 *(2.53)*	0.09 *(0.34)*	Relative humidity
33.52 *(24.99)*	2297	3.13 *(11.86)*	0.654 *(0.398)*	10.70 *(2.11)*	0.03 *(0.12)*	54%
16.76 *(12.50)*	2300	2.52 *(9.52)*	1.050 *(0.639)*	6.66 *(1.31)*	0.03 *(0.10)*	Barometer
1.06 *(0.79)*	2300	1.88 *(7.11)*	12.367 *(7.522)*	0.57 *(0.11)*	0.06 *(0.24)*	28.75" Hg *(97.37 kPa)*

Maximum torque - 251 lb.-ft. *(340 Nm)* at 1602 rpm
Maximum torque rise - 39.1%
Torque rise at 1761 engine rpm - 35%
Power increase at 1851 engine rpm- 10.8%

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Engaged dB(A)	Front Wheel Drive Disengaged dB(A)
At no load in 7th (B3) gear	73.8	73.7
Transport in 16th (D4) gear		76.8
Bystander in 16th (D4) gear		80.6

Horizontal distances of drawbar hitch point behind rear wheel axis - 28.5"*(725 mm)*, 32.5"*(825 mm)*, 34.4"*(875 mm)*

TIRES AND WEIGHT	Tested without ballast
Rear tires–No., size, ply & psi *(kPa)*	Two 16.9-30;6;12 *(85)*
Front tires–No., size, ply & psi *(kPa)*	Two 11.2-24;6;18 *(125)*
Height of drawbar	17.5 in *(445 mm)*
Static weight with operator– Rear	5650 lb *(2563 kg)*
– Front	3510 lb *(1592 kg)*
– Total	9160 lb *(4155 kg)*

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln Nebraska 68583-0832
Dates of tests: September 25 - 27, 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)*** 0.8404 **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** 10.0 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.** *PE4045U064165* **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: 31.9 - 34.4 lb/h *(14.4 - 15.6 kg/h)* **High idle:** 2275 - 2325 rpm **Turbo boost:** nominal 16.0 - 18.9 psi *(110 - 130 kPa)* as measured 18.2 psi *(125 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *1LV5090MCJJ400430* **Tread width** rear 59.4" *(1508 mm)* to 71.4" *(1813 mm)* front 52.8" *(1342 mm)* to 77.0" *(1957 mm)* **Wheelbase** 92.5" *(2350 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph *(km/h)*** first 1.16 *(1.87)* second 1.48 *(2.38)* third 1.80 *(2.89)* fourth 2.14 *(3.45)* fifth 2.80 *(4.50)* sixth 3.57 *(5.75)* seventh 4.33 *(6.97)* eighth 5.18 *(8.33)* ninth 6.85 *(11.03)* tenth 8.76 *(14.09)* eleventh 10.59 *(17.05)* twelfth 10.61 *(17.07)* thirteenth 12.68 *(20.41)* fourteenth 13.53 *(21.77)* fifteenth 16.39 *(26.38)* sixteenth 19.60 *(31.54)*

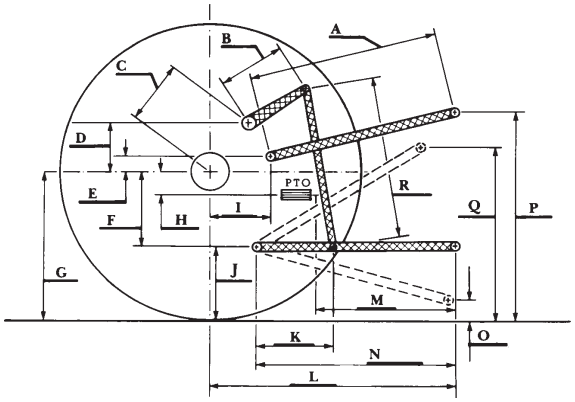
HYDRAULIC PERFORMANCE

CATEGORY: II
Quick Attach: None
OECD Static test

		lift cylinders
Maximum force exerted through whole range:	5161 lbs *(23.0 kN)*	(2 x 65 mm)
	5958 lbs *(26.5 kN)*	(1 x 65 mm and 1 x 75 mm)
	single outlet set	two outlet sets combined
i) Sustained pressure of the open relief valve:	2873 psi *(198 bar)*	2890 psi *(199 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	19.4 GPM *(73.4 l/min)*	19.6 GPM *(74.0 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	17.6 GPM *(66.7 l/min)*	17.9 GPM *(67.7 l/min)*
Delivery pressure:	2640 psi *(182 bar)*	2714 psi *(187 bar)*
Power:	27.1 HP *(20.2 kW)*	28.3 HP *(21.1 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	24.9	*632*
B	14.1	*358*
C	17.7	*449*
D	15.0	*380*
E	11.8	*300*
F	8.8	*223*
G	31.3	*795*
H	0.2	*4*
I	16.1	*410*
J	22.5	*572*
K	17.5	*444*
L	41.7	*1060*
M	23.0	*585*
N	33.1	*840*
O	9.1	*230*
P	46.5	*1182*
Q	38.4	*975*
R	32.3	*820*



reverse 1.28 *(2.06)*, 1.63 *(2.62)*, 1.98 *(3.18)*, 2.36 *(3.80)*, 3.08 *(4.96)*, 3.93 *(6.33)*, 4.77 *(7.68)*, 5.70 *(9.18)*, 7.56 *(12.16)*, 9.64 *(15.52)*, 11.68 *(18.79)*, 11.69 *(18.81)*, 13.98 *(22.49)*, 14.91 *(23.99)*, 18.07 *(29.08)*, 21.60 *(34.76)* **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** 8985 lb *(4075 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: The manufacturer declares that the average time between active regenerations is 150 hours. A 1% power increase 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.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2204**, November 29, 2018.

Roger M. Hoy
Director

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

Shiftable PTO Performance

Economy mode
540 PTO rpm @1645 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)*
77.65 *(57.90)*	1645	4.20 *(15.90)*	0.379 *(0.230)*	18.49 *(3.64)*	0.20 *(0.74)*
58.21 *(43.41)*	1645	3.32 *(12.55)*	0.399 *(0.243)*	17.55 *(3.46)*	0.13 *(0.49)*
38.82 *(28.95)*	1645	2.45 *(8.26)*	0.441 *(0.268)*	15.87 *(3.13)*	0.09 *(0.35)*
19.36 *(14.44)*	1646	1.76 *(6.67)*	0.637 *(0.388)*	10.98 *(2.16)*	0.01 *(0.05)*
0.91 *(0.68)*	1643	1.12 *(4.25)*	8.667 *(5.272)*	0.81 *(0.16)*	0.02 *(0.08)*

Normal mode
540 PTO rpm @2100 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)*
77.68 *(57.93)*	2102	4.71 *(17.83)*	0.424 *(0.258)*	16.49 *(3.25)*	0.17 *(0.65)*
58.23 *(43.42)*	2104	3.90 *(14.78)*	0.469 *(0.285)*	14.91 *(2.94)*	0.12 *(0.47)*
38.81 *(28.94)*	2099	3.13 *(11.85)*	0.564 *(0.343)*	12.40 *(2.44)*	0.06 *(0.22)*
19.44 *(14.50)*	2100	2.28 *(8.64)*	0.822 *(0.500)*	8.52 *(1.68)*	0.01 *(0.03)*
0.87 *(0.65)*	2099	1.62 *(6.12)*	12.944 *(7.874)*	0.54 *(0.11)*	0.06 *(0.21)*

RECOMMENDED CITATION FORMAT:

NTTL.(2018). Nebraska Tractor test 2204 for John Deere 5090M Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from http://tractortestlab.unl.edu

JOHN DEERE 5090M DIESEL
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