2022

Test 2254: John Deere 5090M

Nebraska Tractor Test Lab

NEBRASKA TRACTOR TEST 2254
JOHN DEERE 5090M PowrReverser 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)						
75.49 *(56.29)*	2201	4.98 *(18.85)*	0.464 *(0.282)*	15.16 *(2.99)*	0.13 *(0.50)*	Fuel used during active exhaust regeneration-0.81 gal *(3.06 l)* (see note 1, p.2)
Standard Power Take-off Speed(540rpm)						
78.34 *(58.42)*	2100	4.79 *(18.12)*	0.430 *(0.261)*	16.36 *(3.22)*	0.12 *(0.47)*	
Maximum Power (1 hour)						
84.40 *(62.94)*	1851	4.68 *(17.71)*	0.390 *(0.237)*	18.04 *(3.55)*	0.12 *(0.47)*	
VARYING POWER AND FUEL CONSUMPTION						
75.49 *(56.29)*	2201	4.98 *(18.85)*	0.464 *(0.282)*	15.16 *(2.99)*	0.13 *(0.50)*	Air temperature
65.59 *(48.91)*	2251	4.64 *(17.55)*	0.497 *(0.302)*	14.15 *(2.79)*	0.12 *(0.44)*	72°F *(22°C)*
49.70 *(37.06)*	2277	3.90 *(14.77)*	0.552 *(0.336)*	12.74 *(2.51)*	0.09 *(0.35)*	Relative humidity
33.52 *(24.99)*	2300	3.15 *(11.94)*	0.662 *(0.403)*	10.62 *(2.09)*	0.07 *(0.26)*	45%
16.73 *(12.47)*	2300	2.47 *(9.36)*	1.040 *(0.633)*	6.76 *(1.33)*	0.05 *(0.19)*	Barometer
0.21 *(0.16)*	2299	1.83 *(6.92)*	59.983 *(36.486)*	0.12 *(0.02)*	0.05 *(0.18)*	28.77" Hg *(97.43 kPa)*

Maximum torque - 254 lb.-ft. *(345 Nm)* at 1602 rpm
Maximum torque rise - 41.3%
Torque rise at 1761 engine rpm - 35%
Power increase at 1851 engine rpm- 11.8%

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Engaged dB(A)	Front Wheel Drive Disengaged dB(A)
At no load in 7th (B3) gear	74.7	74.8
Transport in 16th (D4) gear		74.8
Bystander in 16th (D4) gear		79.2

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 460/85R30;**;12 *(85)*
Front tires–No., size, ply & psi *(kPa)*	Two 320/85R24;**;12 *(85)*
Height of drawbar	16.5 in *(420 mm)*
Static weight with operator– Rear	6040 lb *(2740 kg)*
– Front	3750 lb *(1701 kg)*
– Total	9790 lb *(4441 kg)*

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

Dates of tests: September 22 - 27, 2022

Manufacturer: John Deere India Private Limited, Gat No. 166-167, 217-291, Pune Nagar Road Sanaswadi Village, Pune - 412208

CONSUMABLE Fluids, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8447 **Fuel weight** 7.034 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** 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** 13.0 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.** *PE4045U146245* **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) and regenerative DPF (diesel particulate filter) with an underhood muffler and vertical exhaust **Cooling medium temperature control** 2 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 32.3 - 35.6 lb/h *(14.7 - 16.2 kg/h)* **High idle:** 2250 - 2350 rpm **Turbo boost:** nominal 13.8 - 15.2 psi *(95 - 105 kPa)* as measured 14.2 psi *(98 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *1PY5115MJNB000640* **Tread width** rear 58.9" *(1497 mm)* to 70.7" *(1795 mm)* front 55.0" *(1398 mm)* to 78.7" *(1998 mm)* **Wheelbase** 92.5" *(2350 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph *(km/h)*** first 1.17 *(1.89)* second 1.61 *(2.59)* third 1.98 *(3.19)* fourth 2.54 *(4.08)* fifth 2.83 *(4.56)* sixth 3.88 *(6.25)* seventh 4.78 *(7.69)* eighth 6.11 *(9.84)* ninth 6.51 *(10.47)* tenth 8.91 *(14.34)* eleventh 10.91 *(17.56)* twelfth 10.97 *(17.65)* thirteenth 14.03 *(22.58)* fourteenth 14.94 *(24.05)* fifteenth 18.39 *(29.60)* sixteenth 23.53 *(37.87)*

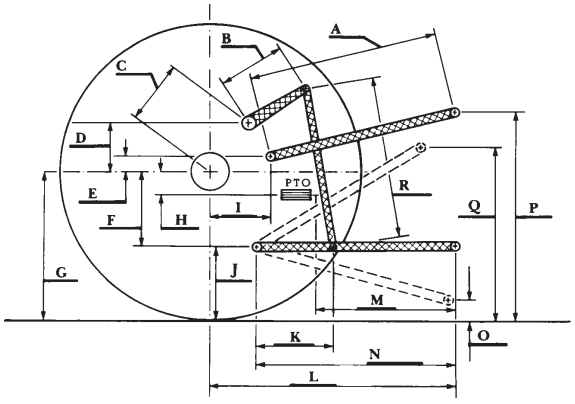
HYDRAULIC PERFORMANCE

CATEGORY: 2
Quick Attach: None
OECD Static test

		lift cylinders
Maximum force exerted through whole range:	6979 lbs *(31.0 kN)*	(2 x 75 mm)
	7872 lbs *(35.0 kN)*	(2 x 80 mm)
	single outlet set	two outlet sets combined
i) Sustained pressure of the open relief valve:	2869 psi *(198 bar)*	2869 psi *(198 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	19.0 GPM *(72.0 l/min)*	19.1 GPM *(72.2 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	18.3 GPM *(69.1 l/min)*	18.6 GPM *(70.6 l/min)*
Delivery pressure:	2405 psi *(166 bar)*	2500 psi *(172 bar)*
Power:	25.6 HP *(19.1 kW)*	27.2 HP *(20.3 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	26.4	*670*
B	14.1	*358*
C	17.7	*449*
D	15.0	*380*
E	14.4	*365*
F	8.8	*223*
G	31.3	*795*
H	0.2	*4*
I	14.4	*365*
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 1.29 *(2.08)*, 1.77 *(2.85)*, 2.18 *(3.51)*, 2.48 *(3.99)*, 3.13 *(5.03)*, 4.28 *(6.89)*, 5.27 *(8.48)*, 6.74 *(10.84)*, 7.17 *(11.54)*, 9.82 *(15.81)*, 12.03 *(19.36)*, 12.09 *(19.45)*, 15.46 *(24.88)*, 16.47 *(26.50)*, 20.28 *(32.63)*, 24.85 *(40.00)* **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** 9615 lb *(4361 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: The manufacturer declares that the average time between active regenerations is over 50 hours. A 5% power decrease was observed during the active exhaust regeneration.

NOTE 2: The performance figures on this report are the result of replacing the electronic control module of the John Deere 5115M with the John Deere 5090M module.

NOTE 3: The performance data on this report applies to tractors with chassis serial numbers that begin with 1PY....

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor fell 1% short of meeting the manufacturer's remote hydraulic flow claim of 19.3 GPM *(73 l/min)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2254,** February 9, 2023.

Roger M. Hoy
Director

P.J. Jasa
J.D. Luck
S. Pitla
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)*
77.27 *(57.62)*	1644	4.17 *(15.80)*	0.380 *(0.231)*	18.51 *(3.65)*	0.15 *(0.57)*
58.15 *(43.36)*	1651	3.31 *(12.54)*	0.401 *(0.244)*	17.56 *(3.46)*	0.11 *(0.41)*
38.76 *(28.90)*	1646	2.48 *(9.40)*	0.451 *(0.274)*	15.61 *(3.07)*	0.07 *(0.25)*
19.35 *(14.43)*	1648	1.86 *(7.05)*	0.677 *(0.412)*	10.39 *(2.05)*	0.03 *(0.13)*
0.11 *(0.08)*	1647	1.05 *(3.98)*	65.841 *(40.050)*	0.11 *(0.02)*	0.06 *(0.21)*

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)*
77.31 *(57.65)*	2102	4.71 *(17.84)*	0.429 *(0.261)*	16.40 *(3.23)*	0.14 *(0.52)*
58.18 *(43.38)*	2100	4.00 *(15.13)*	0.483 *(0.294)*	14.56 *(2.87)*	0.12 *(0.47)*
38.75 *(28.90)*	2107	3.02 *(11.43)*	0.548 *(0.333)*	12.84 *(2.53)*	0.08 *(0.32)*
19.39 *(14.46)*	2106	2.33 *(8.81)*	0.844 *(0.514)*	8.33 *(1.64)*	0.05 *(0.19)*
0.12 *(0.09)*	2108	1.52 *(5.74)*	88.305 *(53.714)*	0.08 *(0.02)*	0.06 *(0.22)*

RECOMMENDED CITATION FORMAT:

NTTL.(2023). Nebraska Tractor test 2254 for John Deere 5090M PowrReverser Diesel. Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from http://tractortestlab.unl.edu

JOHN DEERE 5090M PowrReverser DIESEL

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