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2020

Test 2218: Kubota M8-201

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2218-SUMMARY 1165

KUBOTA M8-201 DIESEL

30 SPEED

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—1053 rpm)						
179.86 (134.12)	2101	10.48 (39.68)	0.408 (0.248)	17.16 (3.38)	1.06 (4.01)	Fuel used during active exhaust regeneration-0.24 gal (0.92 l) (see note 1, p.2)
Standard Power Take-off Speed (1000 rpm)						
173.99 (129.75)	1995	9.95 (37.66)	0.400 (0.243)	17.49 (3.44)	1.04 (3.94)	

VARYING POWER AND FUEL CONSUMPTION

179.86 (134.12)	2101	10.48 (39.68)	0.408 (0.248)	17.16 (3.38)	1.06 (4.01)	Air temperature
156.58 (116.76)	2155	9.50 (35.96)	0.424 (0.258)	16.48 (3.25)	0.84 (3.16)	74°F (24°C)
118.78 (88.57)	2176	7.98 (30.21)	0.470 (0.286)	14.88 (2.93)	0.53 (1.99)	Relative humidity
80.15 (59.77)	2205	6.13 (23.19)	0.535 (0.325)	13.08 (2.58)	0.36 (1.34)	41%
40.89 (30.49)	2236	4.34 (16.44)	0.743 (0.452)	9.41 (1.85)	0.22 (0.82)	Barometer
1.24 (0.92)	2259	2.66 (10.07)	15.013 (9.132)	0.47 (0.09)	0.14 (0.52)	28.63" Hg (96.94 kPa)

Maximum torque - 563 lb.-ft. (763 Nm) at 1401 rpm

Maximum torque rise - 25.2%

Torque rise at 1681 engine rpm - 19%

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		D.E.F. Consumption	Temp. °F(°C)	Barom. inch Hg (kPa)	
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	lb/hp.hr (kg/kW.h)	cool- ing med	Air dry bulb	
Power at Rated Engine Speed—10th (C1) Gear										
164.55 (122.70)	11954 (53.17)	5.16 (8.30)	2100	3.8	0.444 (0.270)	15.77 (3.11)	0.057 (0.035)	189 (87)	69 (21)	28.95 (98.04)
75% of Pull at Rated Engine Speed—10th (C1) Gear										
127.74 (95.25)	8914 (39.65)	5.37 (8.64)	2170	2.9	0.469 (0.285)	14.92 (2.94)	0.050 (0.031)	185 (85)	75 (24)	29.00 (98.21)
50% of Pull at Rated Engine Speed—10th (C1) Gear										
87.58 (65.30)	5983 (26.61)	5.49 (8.84)	2198	2.0	0.537 (0.327)	13.02 (2.56)	0.053 (0.032)	183 (84)	76 (24)	29.00 (98.21)
75% of Pull at Reduced Engine Speed—14th (C3) Gear										
127.85 (95.34)	8903 (39.60)	5.39 (8.67)	1564	2.9	0.419 (0.255)	16.71 (3.29)	0.053 (0.032)	196 (91)	77 (25)	29.00 (98.21)
50% of Pull at Reduced Engine Speed—14th (C3) Gear										
87.73 (65.42)	5968 (26.55)	5.51 (8.87)	1587	2.0	0.458 (0.278)	15.28 (3.01)	0.053 (0.032)	191 (88)	78 (26)	29.00 (98.21)

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

Dates of tests: June 10 to July 15, 2020

Manufacturer: Buhler Versatile, 1260 Clarence Ave Winnipeg, Manitoba, Canada R3T 1T2

CONSUMABLE FLUIDS, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8402 **Fuel weight** 6.996 lbs/gal (0.838 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE 15W40 API service classification** CK-4 **Transmission and hydraulic lubricant** Kubota Super UDT2 fluid **Front axle lubricant** Kubota Super UDT2 fluid **Total time engine was operated:** 22.5 hours

ENGINE: Make Cummins **Diesel Type** six cylinder vertical with turbocharger, air to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** *74497640* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.213" x 4.882" (107.0 mm x 124.0 mm) **Compression ratio** 17.3 to 1 **Displacement** 408 cu in (6690 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** DOC (diesel oxidation catalyst), SCR (selective catalyst reduction) and regenerative DPF (diesel particulate filter) integrated within a vertical muffler **Cooling medium temperature control** thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 71.2 - 75.6 lb/h (32.3 - 34.3 kg/h) **High idle:** 2240 - 2280 rpm **Turbo boost:** nominal 16.7 - 18.9 psi (115 - 130 kPa) as measured 18.3 psi (126 kPa)

CHASSIS: Type front wheel assist with duals **Serial No.** *BVWFW210AKA580027* **Tread width** rear 61.0" (1550 mm) to 128.0" (3250 mm) front 61.0" (1550 mm) to 88.0" (2235 mm) **Wheelbase** 114.0" (2896 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (6) range operator controlled power shift **Nominal travel speeds mph (km/h)** first 1.98 (3.19) second 2.34 (3.76) third 2.76 (4.44) fourth 3.25 (5.23) fifth 3.55 (5.71) sixth 3.84 (6.18) seventh 4.18 (6.72) eighth 4.52 (7.28) ninth 4.93 (7.94) tenth 5.34 (8.60) eleventh 5.81 (9.35) twelfth 6.29 (10.13) thirteenth 6.87 (11.06) fourteenth 7.43 (11.96) fifteenth 8.09 (13.02) sixteenth 8.76 (14.09) seventeenth 9.92 (15.96) eighteenth 10.35 (16.66) nineteenth 11.68 (18.79) twentieth 12.19 (19.62) twenty-first 13.79 (22.19)

DRAWBAR PERFORMANCE

UNBALLASTED - FRONT DRIVE ENGAGED - 2100 ENGINE RPM MAXIMUM POWER IN SELECTED GEARS

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)
1st(A1) Gear										
103.10 (76.88)	21883 (97.34)	1.77 (2.85)	2181	14.6	0.529 (0.322)	13.23 (2.61)	0.056 (0.034)	183 (84)	74 (23)	28.99 (98.17)
2nd(A2) Gear										
121.90 (90.90)	21204 (94.32)	2.16 (3.47)	2169	11.5	0.499 (0.304)	14.02 (2.76)	0.054 (0.033)	184 (84)	74 (23)	28.99 (98.17)
3rd(A3) Gear										
141.36 (105.41)	20736 (92.24)	2.56 (4.12)	2156	10.4	0.474 (0.288)	14.76 (2.91)	0.055 (0.033)	185 (85)	73 (23)	29.00 (98.21)
4th(A4) Gear										
157.82 (117.68)	19828 (88.20)	2.99 (4.80)	2100	8.3	0.456 (0.278)	15.33 (3.02)	0.056 (0.034)	188 (86)	72 (22)	29.00 (98.19)
5th(B1) Gear										
160.57 (119.74)	18138 (80.68)	3.32 (5.34)	2100	6.6	0.447 (0.272)	15.66 (3.09)	0.056 (0.034)	189 (87)	73 (23)	29.00 (98.21)
6th(A5) Gear										
160.19 (119.45)	16488 (73.34)	3.64 (5.86)	2100	5.3	0.453 (0.275)	15.46 (3.04)	0.058 (0.035)	188 (86)	72 (22)	28.95 (98.04)
7th(B2) Gear										
162.77 (121.37)	15300 (68.06)	3.99 (6.42)	2100	4.8	0.445 (0.271)	15.73 (3.10)	0.058 (0.035)	189 (87)	68 (20)	28.95 (98.04)
8th(A6) Gear										
158.98 (118.55)	13733 (61.09)	4.34 (6.98)	2100	4.2	0.454 (0.276)	15.41 (3.04)	0.059 (0.036)	189 (87)	73 (23)	28.95 (98.04)
9th(B3) Gear										
165.25 (123.23)	13045 (58.03)	4.75 (7.64)	2100	4.1	0.437 (0.266)	16.00 (3.15)	0.057 (0.035)	189 (87)	68 (20)	28.95 (98.02)
10th(C1) Gear										
164.55 (122.70)	11954 (53.17)	5.16 (8.30)	2100	3.8	0.444 (0.270)	15.77 (3.11)	0.057 (0.035)	189 (87)	69 (21)	28.95 (98.04)
11th(B4) Gear										
161.32 (120.30)	10745 (47.79)	5.63 (9.06)	2100	3.2	0.448 (0.272)	15.62 (3.08)	0.059 (0.036)	191 (88)	76 (24)	28.95 (98.04)
12th(C2) Gear										
160.94 (120.01)	9867 (43.89)	6.12 (9.82)	2100	2.9	0.450 (0.274)	15.54 (3.06)	0.059 (0.036)	190 (88)	70 (21)	28.95 (98.04)
13th(B5) Gear										
157.14 (117.18)	8802 (39.15)	6.70 (10.77)	2100	2.7	0.457 (0.278)	15.30 (3.01)	0.060 (0.037)	191 (88)	75 (24)	28.96 (98.07)
14th(C3) Gear										
161.32 (120.30)	8351 (37.15)	7.25 (11.66)	2101	2.6	0.451 (0.274)	15.52 (3.06)	0.059 (0.036)	191 (88)	71 (22)	28.95 (98.04)
15th(B6) Gear										
153.44 (114.42)	7266 (32.32)	7.92 (12.75)	2100	2.3	0.468 (0.285)	14.94 (2.94)	0.061 (0.037)	191 (88)	75 (24)	28.96 (98.07)
16th(C4) Gear										
157.09 (117.14)	6872 (30.57)	8.57 (13.79)	2100	2.1	0.458 (0.278)	15.29 (3.01)	0.060 (0.036)	192 (89)	75 (24)	28.96 (98.07)

twenty-second 16.24 (26.13) twenty-third 19.20 (30.90) twenty-fourth 19.76 (31.80) twenty-fifth 22.62 (36.40) twenty-sixth 23.27 (37.45) twenty-seventh 24.86 (40.00) twenty-eighth 24.86 (40.00) twenty-ninth 24.86 (40.00) thirtieth 24.86 (40.00) electronically limited reverse 2.17 (3.49), 3.01 (4.85), 3.88 (6.24), 4.20 (6.76), 5.39 (8.68), 5.84 (9.40), 7.51 (12.09), 8.12 (13.07), 10.84 (17.44), 11.32 (18.21), 15.07 (24.25), 16.78 (27.00), 16.78 (27.00), 16.78 (27.00), 16.78 (27.00) electronically limited **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 1000 rpm at 1995 engine rpm, Economy PTO 1000 rpm at 1600 engine rpm **Unladen tractor mass** 21915 lb (9940 kg)

NOTE 1: The manufacturer declares that the average time between active regenerations is 50 hours.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. The manufacturer's claim of a gain of 20 hp (15 kW) from engine speed 2100 rpm (200 hp (149 kW)) to 1900 rpm 220 hp (164 kW) was not verified. The manufacturer's remote hydraulic flow claim of 31 GPM (118 l/min) with standard pump was not verified. This tractor fell 2.3% short of meeting the manufacturers remote hydraulic claim of 47 GPM (178 l/min) at 2250 rpm and 2.0% short of meeting the claim of 44 GPM (166 l/min) at 2100 engine rpm. The performance figures on this report 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. **2218**, Nebraska Summary 1165, November 12, 2020.

Roger M. Hoy
Director

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

Horizontal distances of drawbar hitch point behind rear wheel axis - 34.8"(883 mm), 40.6"(1032 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 480/80R46;***;10(70)
Two 380/85R34;***;17(115)
20.0 in (510 mm)
13995 lb (6348 kg)
8095 lb (3672 kg)
22090 lb (10020 kg)

Shiftable PTO Performance

Economy mode

1000 PTO rpm @ 1600 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption	
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)
169.52 (126.41)	1600	9.10 (34.44)	0.376 (0.228)	18.63 (3.67)	0.95 (3.59)
127.49 (95.07)	1605	7.39 (27.97)	0.405 (0.247)	17.25 (3.40)	0.55 (2.08)
85.03 (63.41)	1605	5.53 (20.92)	0.455 (0.277)	15.38 (3.03)	0.27 (1.03)
42.94 (32.02)	1602	3.49 (13.20)	0.568 (0.345)	12.32 (2.43)	0.18 (0.67)
0.79 (0.59)	1606	1.66 (6.28)	14.681 (8.930)	0.48 (0.09)	0.12 (0.46)

Normal mode

1000 PTO rpm @ 1995 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption	
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)
169.56 (126.44)	1995	9.72 (36.81)	0.401 (0.244)	17.44 (3.43)	0.87 (3.30)
127.39 (95.00)	1993	7.92 (29.97)	0.435 (0.264)	16.09 (3.17)	0.52 (1.97)
85.08 (63.44)	1990	6.04 (22.86)	0.497 (0.302)	14.09 (2.78)	0.31 (1.16)
42.91 (31.99)	1989	4.04 (15.30)	0.659 (0.401)	10.62 (2.09)	0.24 (0.91)
0.83 (0.62)	1993	2.48 (9.38)	20.780 (12.640)	0.34 (0.07)	0.13 (0.51)

HYDRAULIC PERFORMANCE

CATEGORY: 3

Quick Attach: None

OECD Static test

Maximum force exerted through whole range: 13930 lbs (62.0 kN) 2 x 100 mm lift cylinders

i) Maximum observed pressure: 2905 psi (200 bar)

three outlet sets combined

ii) Pump delivery rate at minimum pressure: 43.1 GPM (163.2 l/min) 2108 engine rpm

45.9 GPM (173.7 l/min) 2248 engine rpm

iii) Pump delivery rate at maximum

hydraulic power: 42.5 GPM (160.9 l/min)

Delivery pressure: 2755 psi (190 bar)

Power: 68.3 HP (50.9 kW)

ii) Pump delivery rate at minimum pressure

and rated engine speed: 32.1 GPM (121.5 l/min)

iii) Pump delivery rate at maximum

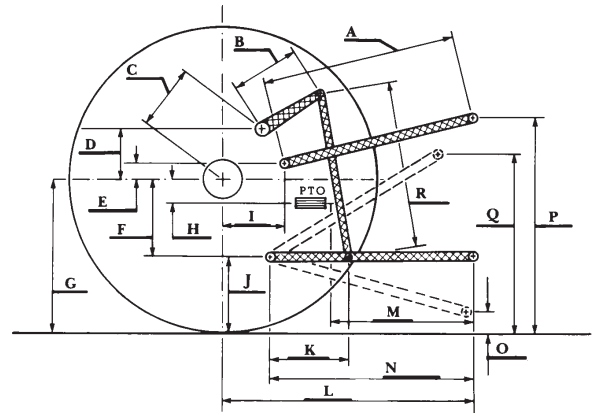
hydraulic power: 32.1 GPM (121.6 l/min)

Delivery pressure: 2523 psi (174 bar)

Power: 47.3 HP (35.3 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	30.5	775
B	12.9	328
C	19.4	492
D	17.5	445
E	11.5	292
F	9.1	230
G	36.4	925
H	9.8	249
I	16.1	408
J	27.3	695
K	19.1	485
L	46.5	1181
M	25.1	638
N	38.6	981
O	9.1	230
P	54.3	1380
Q	39.6	1005
R	33.5	850



TRACTOR SOUND LEVEL WITH CAB

	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 8th (A6) gear	73.7	70.9
Bystander in 24th (E1) gear		78.4

RECOMMENDED CITATION FORMAT:

NTTL.(2020). Nebraska OECD tractor test 2218 for Kubota M8-201 Diesel.

Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



KUBOTA M8-201 DIESEL

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