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2016

Test 2152: Kubota M5-111

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 2152

KUBOTA M5-111 DIESEL

24 SPEED

POWER TAKE-OFF PERFORMANCE

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)	Mean Atmospheric Conditions
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MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—(PTO speed—690 rpm)						
97.09 (72.40)	2601	6.11 (23.13)	0.441 (0.268)	15.89 (3.13)	0.11 (0.40)	Fuel used during active exhaust regeneration-0.12 gal (0.45 l) (see note 1, p.2)
Maximum Power (1 hour)						
97.85 (72.97)	2499	6.01 (22.75)	0.430 (0.262)	16.28 (3.21)	0.11 (0.40)	
Standard Power Take-off Speed (540 rpm)						
88.68 (66.13)	2035	5.04 (19.07)	0.398 (0.242)	17.60 (3.47)	0.10 (0.37)	

VARYING POWER AND FUEL CONSUMPTION

97.09 (72.40)	2601	6.11 (23.13)	0.441 (0.268)	15.89 (3.13)	0.11 (0.40)	Air temperature
83.77 (62.46)	2641	5.54 (20.95)	0.463 (0.282)	15.13 (2.98)	0.09 (0.34)	79°F (26°C)
63.64 (47.46)	2674	4.59 (17.39)	0.506 (0.308)	13.85 (2.73)	0.07 (0.25)	Relative humidity
42.95 (32.03)	2705	3.68 (13.92)	0.600 (0.365)	11.68 (2.30)	0.05 (0.18)	41%
21.62 (16.12)	2730	2.77 (10.50)	0.899 (0.547)	7.80 (1.54)	0.05 (0.17)	Barometer
2.72 (2.03)	2761	1.92 (7.26)	4.942 (3.006)	1.42 (0.28)	0.04 (0.16)	28.65" Hg (97.02 kPa)

Maximum torque - 242 lb.-ft. (328 Nm) at 1549 rpm
Maximum torque rise - 23.3%
Torque rise at 2081 engine rpm - 18%
Power increase at 2499 engine rpm - 0.8%

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 10th(HL5) gear	80.2	79.9
Bystander in 23th(HH5) gear	---	83.5

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 18.4R30; **, 12 (85)
Two 12.4R24; **, 12 (85)
17.5 in (445 mm)
4915 lb (2229 kg)
2945 lb (1336 kg)
7860 lb (3565 kg)

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

Dates of tests: June 6 - 13, 2016

Manufacturer: Kubota Tsukuba Plant 10, Sakano-Shinden, Tsukuba-Mirai-City, Ibaraki, 300-2402 Japan

CONSUMABLE FLUIDS, OIL and TIME:

Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8417 **Fuel weight** 7.008 lbs/gal (0.840 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil** SAE 10W-30 **API service classification** CJ-4 **Transmission and hydraulic lubricant** Kubota Super UDT2 fluid **Front axle lubricant** SAE 90 gear oil **Total time engine was operated** 10.0 hours

ENGINE: Make Kubota **Diesel Type** four cylinder vertical with turbocharger, air to air intercooler and D.E.F.(diesel exhaust fluid) exhaust treatment **Serial No.** 2FU4657 **Crankshaft** lengthwise **Rated engine speed** 2600 **Bore and stroke** 3.937" x 4.724" (100.0 mm x 120.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 230 cu in (3769 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 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** one thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 41.2 - 43.9 lb/h (18.7 - 19.9 kg/h) **High idle:** 2700 - 2800 rpm **Turbo boost:** nominal 13.1 - 16.0 psi (90 - 110 kPa) as measured 14.5 psi (100 kPa)

CHASSIS: Type front wheel assist **Serial No.** *M5-111D-52206* **Tread width** rear 59.1" (1500 mm) to 75.2" (1910 mm) front 61.8" (1570 mm) to 65.7" (1670 mm) **Wheelbase** 88.6" (2250 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.37 (2.21) second 1.63 (2.63) third 1.88 (3.03) fourth 2.24 (3.60) fifth 2.42 (3.90) sixth 2.88 (4.64) seventh 3.13 (5.04) eighth 3.72 (5.99) ninth 3.87 (6.22) tenth 4.59 (7.39) eleventh 5.54 (8.91) twelfth 6.08 (9.78) thirteenth 6.58 (10.59) fourteenth 7.23 (11.63) fifteenth 8.31 (13.38) sixteenth 9.88 (15.90) seventeenth 10.72 (17.25) eighteenth

HYDRAULIC PERFORMANCE

CATEGORY: II

Quick attach: None

OECD Static test

Maximum force exerted through whole range: 6192 lbs (27.5 kN) (2 x 75 mm)
4698 lbs (20.9 kN) (2 x 65 mm)

lift cylinders

i) Sustained pressure of the open relief valve: 2957 psi (204 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 17.0 GPM (64.4 l/min)

iii) Pump delivery rate at maximum

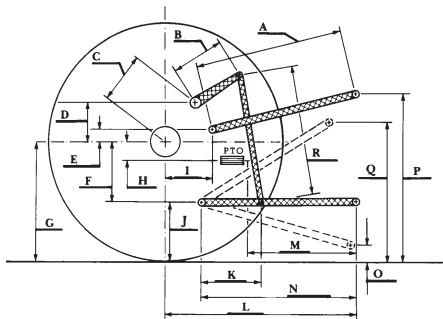
hydraulic power: 14.5 GPM (54.9 l/min)

Delivery pressure: 2398 psi (165 bar)

Power: 20.3 HP (15.1 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.1	740
B	11.0	280
C	12.0	306
D	11.3	287
E	11.3	287
F	9.3	235
G	28.4	720
H	0.3	7
I	10.4	264
J	19.1	485
K	16.3	414
L	38.6	980
M	23.8	605
N	31.3	795
O	9.1	230
P	43.1	1095
Q	34.1	865
R	24.4	620



12.74 (20.50) nineteenth 13.84 (22.27) twentieth 16.45 (26.47) twenty-first 17.09 (27.50) twenty-second 19.57 (31.50) twenty-third 20.31 (32.68) twenty-fourth 23.30 (37.50) electronically limited reverse 1.39 (2.24), 1.65 (2.66), 1.90 (3.06), 2.26 (3.64), 2.45 (3.95), 2.92 (4.70), 3.17 (5.10), 3.77 (6.06), 3.91 (6.30), 4.65 (7.49), 5.60 (9.02), 6.16 (9.91), 6.66 (10.72), 7.31 (11.77), 8.41 (13.54) 10.00 (16.09), 10.85 (17.46), 12.89 (20.75), 14.01 (22.55), 16.65 (26.80), 17.30 (27.84), 19.82 (31.89), 20.56 (33.08) 23.55 (37.90) electronically limited **Clutch** multiple wet disc operated by foot pedal **Brakes** multiple wet disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2035 engine rpm, Economy PTO 540 rpm at 1519 engine rpm **Unladen tractor mass** 7685 lb (3486 kg)

NOTE 1: The manufacturer declares that the average time between active regenerations is 18 hours. A 6% power loss was observed during the active exhaust regeneration process.

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 3 point lift of claims of 5181 lbs (2350 kg) with 2 x 65 mm lift cylinders and 7275 lbs (3300 kg) with 2 x 75 mm lift cylinders as per SAE testing standards were not verified.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2152**, July 1, 2016.

Roger M. Hoy
Director

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

Economy mode
540 PTO rpm @ 1519 engine rpm

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	DEF Usage Gal/hr (l/h)
70.69 (52.71)	1519	3.83 (14.48)	0.379 (0.231)	18.47 (3.64)	0.05 (0.18)
53.48 (39.88)	1529	2.99 (11.32)	0.392 (0.238)	17.88 (3.52)	0.05 (0.19)
35.59 (26.54)	1527	2.09 (7.91)	0.411 (0.250)	17.04 (3.36)	0.04 (0.16)
17.82 (13.29)	1528	1.33 (5.02)	0.521 (0.317)	13.44 (2.65)	0.03 (0.13)
2.07 (1.54)	1529	0.69 (2.62)	2.337 (1.442)	3.00 (0.59)	0.03 (0.10)

Normal mode
540 PTO rpm @ 2035 engine rpm

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	DEF Usage Gal/hr (l/h)
70.99 (52.94)	2041	4.13 (15.63)	0.407 (0.248)	17.20 (3.39)	0.03 (0.13)
53.28 (39.73)	2046	3.26 (12.32)	0.428 (0.260)	16.37 (3.22)	0.05 (0.20)
35.45 (26.43)	2037	2.46 (9.32)	0.487 (0.296)	14.40 (2.84)	0.05 (0.18)
17.72 (13.22)	2042	1.72 (6.53)	0.682 (0.415)	10.28 (2.02)	0.05 (0.18)
1.94 (1.44)	2046	1.08 (4.08)	3.904 (2.375)	1.80 (0.35)	0.04 (0.14)



Kubota M5-111 Diesel
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