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2016

## Test 2154: Kubota M6-131

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 2154—SUMMARY 1035

## KUBOTA M6-131 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
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—596 rpm)						
113.31 (84.49)	2201	7.22 (27.35)	0.447 (0.272)	15.68 (3.09)	0.14 (0.51)	Fuel used during active exhaust regeneration-0.16 gal (0.61 l) (see note 1, p.2)
Standard Power Take-off Speed (540 rpm)						
113.77 (84.84)	1994	6.80 (25.75)	0.419 (0.255)	16.73 (3.29)	0.17 (0.65)	
Maximum Power (1 hour)						
115.06 (85.80)	1850	6.67 (25.24)	0.406 (0.247)	17.26 (3.40)	0.17 (0.63)	

#### VARYING POWER AND FUEL CONSUMPTION

113.31 (84.49)	2201	7.22 (27.35)	0.447 (0.272)	15.68 (3.09)	0.14 (0.51)	Air temperature
97.82 (72.95)	2235	6.59 (24.95)	0.472 (0.287)	14.84 (2.92)	0.13 (0.50)	76°F (25°C)
74.50 (55.56)	2264	5.85 (22.16)	0.551 (0.335)	12.73 (2.51)	0.10 (0.37)	Relative humidity
50.46 (37.63)	2301	4.72 (17.86)	0.655 (0.399)	10.69 (2.11)	0.17 (0.65)	45%
25.60 (19.09)	2331	3.61 (13.66)	0.988 (0.601)	7.09 (1.40)	0.13 (0.51)	Barometer
0.81 (0.61)	2373	2.46 (9.31)	21.230 (12.914)	0.33 (0.07)	0.08 (0.31)	28.83" Hg (97.63 kPa)

Maximum torque - 377 lb.-ft. (511 Nm) at 1252 rpm

Maximum torque rise - 39.5%

Torque rise at 1761 engine rpm - 26%

Power increase at 1850 engine rpm - 1.5%

#### 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 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 dry med	Air bulb	Barom. inch Hg (kPa)
Power at Rated Engine Speed—13th (M5) Gear										
94.84 (70.72)	8022 (35.68)	4.43 (7.13)	2200	4.4	0.536 (0.326)	13.07 (2.58)	0.012 (0.007)	194 (90)	78 (26)	28.61 (96.88)
75% of Pull at Rated Engine Speed—13th (M5) Gear										
73.65 (54.92)	6016 (26.76)	4.59 (7.39)	2248	3.0	0.591 (0.359)	11.87 (2.34)	0.012 (0.008)	193 (89)	80 (27)	28.62 (96.92)
50% of Pull at Rated Engine Speed—13th (M5) Gear										
50.41 (37.59)	4017 (17.87)	4.71 (7.58)	2281	2.1	0.735 (0.447)	9.54 (1.88)	0.019 (0.012)	192 (89)	81 (27)	28.64 (96.99)
75% of Pull at Reduced Engine Speed—16th (M7) Gear										
73.88 (55.09)	6088 (27.08)	4.55 (7.32)	1510	3.0	0.479 (0.291)	14.64 (2.88)	0.013 (0.008)	190 (88)	82 (28)	28.64 (96.99)
50% of Pull at Reduced Engine Speed—16th (M7) Gear										
50.44 (37.61)	4019 (17.88)	4.71 (7.58)	1547	2.1	0.554 (0.337)	12.65 (2.49)	0.010 (0.006)	188 (87)	82 (28)	28.61 (96.88)

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

**Dates of tests:** June 2 - 13, 2016

**Manufacturer:** Kubota Corporation, Sakai Plant, 64, Ishizu-Kitamachi, Sakai-ku, Sakai-City, Osaka, 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 10W30 API service classification** CJ-4 **Transmission and hydraulic lubricant** Kubota Super UDT2 fluid **Front axle lubricant** Kubota Super UDT2 fluid **Total time engine was operated:** 20.5 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.** \*3FS0014\* **Crankshaft** lengthwise **Rated engine speed** 2200 Bore and stroke 4.646 x 5.512" (118.0 mm x 140.0 mm) **Compression ratio** 17.5 to 1 **Displacement** 374 cu in (6124 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **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: 49.6 - 52.7 lb/h (22.5 - 23.9 kg/h) **High idle:** 2350 - 2400 rpm **Turbo boost:** nominal 10.9 - 12.3 psi (75 - 85 kPa) as measured 11.8 psi (81 kPa)

**CHASSIS:** Type front wheel assist **Serial No.** M6-131-10244 **Tread width** rear 62.6" (1590 mm) to 82.3" (2090 mm) front 69.9" (1775 mm) to 73.8" (1875 mm) **Wheelbase** 105.9" (2690 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (8) range operator controlled power shift **Nominal travel speeds mph (km/h)** first 0.52 (0.84) second 0.63 (1.01) third 0.76 (1.23) fourth 0.93 (1.50) fifth 1.08 (1.74) sixth 1.31 (2.11) seventh 1.59 (2.56) eighth 1.94 (3.12) ninth 2.20 (3.54) tenth 2.67 (4.30) eleventh 3.24 (5.22) twelfth 3.96 (6.37) thirteenth 4.58 (7.37) fourteenth 5.56 (8.95) fifteenth 6.08 (9.79) sixteenth 6.75 (10.87) seventeenth 7.38 (11.88) eighteenth 8.23 (13.24) nineteenth 8.97 (14.43) twentieth 10.93 (17.59) twenty-first 12.65 (20.36) twenty-second 15.36 (24.72) twenty-third 18.65 (30.01) twenty-fourth 22.73 (36.58)

## DRAWBAR PERFORMANCE

### UNBALLASTED - FRONT DRIVE ENGAGED - 2200 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)
11th(M3) Gear										
79.59 (59.35)	10447 (46.47)	2.86 (4.60)	2223	14.5	0.621 (0.378)	11.28 (2.22)	0.013 (0.008)	194 (90)	77 (25)	28.59 (96.82)
12th(M4) Gear										
90.29 (67.33)	8939 (39.76)	3.79 (6.10)	2200	5.7	0.561 (0.342)	12.48 (2.46)	0.012 (0.007)	194 (90)	78 (25)	28.61 (96.88)
13th(M5) Gear										
94.84 (70.72)	8022 (35.68)	4.43 (7.13)	2200	4.4	0.536 (0.326)	13.07 (2.58)	0.012 (0.007)	194 (90)	78 (26)	28.61 (96.88)
14th(M6) Gear										
93.71 (69.88)	6449 (28.69)	5.45 (8.77)	2200	3.2	0.543 (0.330)	12.90 (2.54)	0.012 (0.007)	194 (90)	78 (25)	28.56 (96.72)
15th(H1) Gear										
93.14 (69.45)	5841 (25.98)	5.98 (9.62)	2200	2.8	0.546 (0.332)	12.82 (2.53)	0.013 (0.008)	194 (90)	79 (26)	28.56 (96.72)
16th(M7) Gear										
91.35 (68.12)	5143 (22.87)	6.66 (10.72)	2200	2.5	0.558 (0.340)	12.55 (2.47)	0.013 (0.008)	194 (90)	78 (26)	28.57 (96.75)
17th(H2) Gear										
90.39 (67.40)	4642 (20.65)	7.30 (11.75)	2200	2.1	0.562 (0.342)	12.46 (2.46)	0.013 (0.008)	194 (90)	80 (27)	28.55 (96.68)
18th(M8) Gear										
85.62 (63.85)	3931 (17.48)	8.17 (13.15)	2201	1.8	0.594 (0.361)	11.80 (2.32)	0.014 (0.008)	194 (90)	78 (26)	28.54 (96.65)

## DRAWBAR PERFORMANCE

### UNBALLASTED - FRONT DRIVE ENGAGED - 1850 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)
11th(M3) Gear										
79.94 (59.61)	10419 (46.35)	2.88 (4.63)	2224	13.9	0.617 (0.375)	11.36 (2.24)	0.013 (0.008)	194 (90)	77 (25)	28.58 (96.78)
12th(M4) Gear										
89.31 (66.60)	9225 (41.03)	3.64 (5.85)	2120	6.1	0.548 (0.333)	12.80 (2.52)	0.013 (0.008)	193 (89)	78 (26)	28.59 (96.82)
13th(M5) Gear										
95.03 (70.86)	8998 (40.02)	3.97 (6.38)	1989	5.5	0.499 (0.304)	14.04 (2.76)	0.015 (0.009)	193 (89)	79 (26)	28.61 (96.88)
14th(M6) Gear										
96.15 (71.70)	7947 (35.35)	4.54 (7.31)	1850	4.0	0.485 (0.295)	14.45 (2.85)	0.015 (0.009)	193 (89)	78 (26)	28.58 (96.78)
15th(H1) Gear										
97.89 (73.00)	7367 (32.77)	4.98 (8.01)	1850	3.6	0.475 (0.289)	14.75 (2.91)	0.015 (0.009)	193 (89)	79 (26)	28.54 (96.65)
16th(M7) Gear										
95.07 (70.89)	6405 (28.49)	5.57 (8.96)	1850	3.0	0.489 (0.298)	14.33 (2.82)	0.015 (0.009)	193 (89)	78 (26)	28.56 (96.72)
17th(H2) Gear										
96.11 (71.67)	5903 (26.26)	6.11 (9.83)	1850	2.7	0.484 (0.294)	14.49 (2.85)	0.015 (0.009)	193 (89)	80 (27)	28.57 (96.75)
18th(M8) Gear										
93.04 (69.38)	5107 (22.71)	6.83 (10.99)	1850	2.3	0.502 (0.306)	13.95 (2.75)	0.016 (0.010)	193 (89)	79 (26)	28.56 (96.72)
19th(H3) Gear										
93.05 (69.39)	4680 (20.82)	7.46 (12.01)	1849	2.0	0.500 (0.304)	14.01 (2.76)	0.016 (0.010)	193 (89)	81 (27)	28.54 (96.65)
20th(H4) Gear										
90.78 (67.69)	3729 (16.59)	9.14 (14.70)	1850	1.6	0.512 (0.312)	13.68 (2.70)	0.016 (0.010)	193 (89)	81 (27)	28.55 (96.68)

reverse 0.52 (0.84), 0.63 (1.02), 0.77 (1.24), 0.94 (1.52), 1.09 (1.75), 1.32 (2.13), 1.61 (2.59), 1.96 (3.15), 2.22 (3.57), 2.70 (4.34), 3.27 (5.27), 3.99 (6.42), 4.62 (7.43), 5.61 (9.03), 6.13 (9.87) 6.81 (10.96), 7.45 (11.99), 8.30 (13.36), 9.04 (14.55), 11.02 (17.74), 12.76 (20.53), 15.49 (24.93), 18.81 (30.27) 22.93 (36.90) **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** 540 rpm at 1994 engine rpm or 1000 rpm at 2050 engine rpm **Unladen tractor mass** 11125 lb (5046 kg)

**NOTE 1:** The manufacturer declares that the average time between active regenerations is 13 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 3 point lift of claims of 6834 lbs (3100 kg) with 2 x 70 mm lift cylinders and 9447 lbs (4285 kg) with 2 x 80 mm lift cylinders as per SAE testing standards were not verified. The performance figures on this summary 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. **2154**, Nebraska Summary 1035, July 1, 2016.

Roger M. Hoy  
Director

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

**DRAWBAR PERFORMANCE**  
**BALLASTED - FRONT DRIVE ENGAGED - 1850 RPM**  
**MAXIMUM POWER IN SELECTED GEARS**

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)	Air dry bulb	Barom. inch Hg (kPa)
10th(M2) Gear										
83.95 (62.60)	13467 (59.90)	2.34 (3.77)	2216	14.7	0.604 (0.367)	11.61 (2.29)	0.014 (0.009)	192 (89)	61 (16)	28.77 (97.43)
11th(M3) Gear										
92.23 (68.77)	12104 (53.84)	2.86 (4.60)	2035	6.6	0.523 (0.318)	13.39 (2.64)	0.016 (0.010)	191 (88)	61 (16)	28.79 (97.49)
12th(M4) Gear										
92.75 (69.16)	10817 (48.12)	3.22 (5.18)	1850	4.9	0.501 (0.305)	13.99 (2.76)	0.016 (0.010)	192 (89)	77 (25)	28.63 (96.95)
13th(M5) Gear										
96.57 (72.01)	9635 (42.86)	3.76 (6.05)	1850	4.1	0.484 (0.294)	14.49 (2.85)	0.015 (0.009)	190 (88)	67 (19)	28.67 (97.09)
14th(M6) Gear										
95.79 (71.43)	7807 (34.73)	4.60 (7.40)	1850	3.1	0.488 (0.297)	14.38 (2.83)	0.016 (0.009)	190 (88)	69 (21)	28.64 (96.99)
15th(H1) Gear										
96.74 (72.14)	7194 (32.00)	5.04 (8.11)	1850	2.8	0.482 (0.293)	14.54 (2.86)	0.014 (0.008)	190 (88)	72 (22)	28.65 (97.02)
16th(M7) Gear										
93.83 (69.97)	6262 (27.85)	5.62 (9.04)	1850	2.4	0.498 (0.303)	14.07 (2.77)	0.016 (0.010)	190 (88)	70 (21)	28.66 (97.05)
17th(H2) Gear										
95.75 (71.40)	5834 (25.95)	6.16 (9.91)	1850	2.3	0.487 (0.296)	14.38 (2.83)	0.016 (0.010)	191 (88)	73 (23)	28.67 (97.09)
18th(M8) Gear										
90.99 (67.85)	4958 (22.05)	6.88 (11.07)	1850	2.0	0.511 (0.311)	13.71 (2.70)	0.016 (0.010)	190 (88)	71 (22)	28.63 (96.95)
19th(H3) Gear										
92.78 (69.19)	4634 (20.61)	7.51 (12.09)	1851	1.9	0.504 (0.306)	13.91 (2.74)	0.016 (0.010)	191 (88)	73 (23)	28.65 (97.02)
20th(H4) Gear										
88.26 (65.81)	3607 (16.04)	9.18 (14.77)	1849	1.5	0.525 (0.320)	13.34 (2.63)	0.017 (0.010)	191 (88)	74 (23)	28.65 (97.02)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 13th (M5) gear	73.6	73.5
Bystander in 24th (H8) gear		81.9

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Two 520/70R38;***;16(110)	Two 520/70R38;***;12(85)
<b>Ballast</b> - Liquid (total)	1890 lb (858 kg)	None
- Cast Iron (total)	695 lb (315 kg)	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Two 420/70R24;***;17(115)	Two 420/70R24;***;12(85)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	1750 lb (794 kg)	None
<b>Height of Drawbar</b>	24.0 in (610 mm)	24.0 in (610 mm)
<b>Static Weight with operator</b> - Rear	9145 lb (4148 kg)	7080 lb (3211 kg)
- Front	6490 lb (2944 kg)	4220 lb (1914 kg)
- Total	15635 lb (7092 kg)	11300 lb (5125 kg)

## HYDRAULIC PERFORMANCE

CATEGORY: II

Quick attach: None

OECD Static test

Maximum force exerted through whole range: lift cylinders  
6734 lbs (30.0 kN) (2 x 70 mm)  
8613 lbs (38.3 kN) (2 x 80 mm)

i) Sustained pressure of the open relief valve: 2786 psi (192 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 20.4 GPM (77.2 l/min)

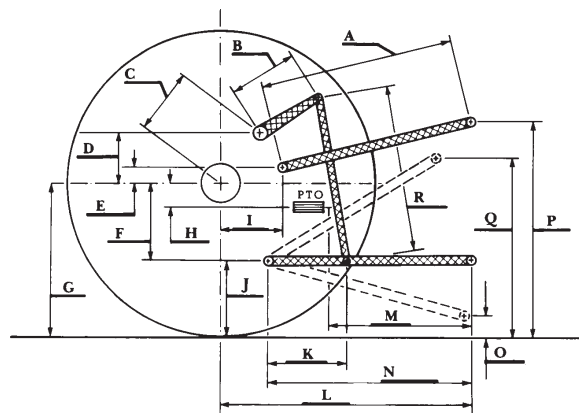
iii) Pump delivery rate at maximum hydraulic power: 19.8 GPM (75.0 l/min)

Delivery pressure: 2302 psi (159 bar)

Power: 26.6 HP (19.9 kW)

## HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.7	755
B	11.8	300
C	17.1	434
D	16.7	425
E	13.6	346
F	6.9	176
G	30.3	770
H	1.0	25
I	10.7	273
J	23.4	594
K	18.4	468
L	40.0	1015
M	23.4	594
N	35.4	900
O	9.1	230
P	49.4	1254
Q	34.6	880
R	28.9	735



**KUBOTA M6-131 DIESEL**

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln