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2017

Test 2176: Kubota M7-131

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2176—SUMMARY 1090

KUBOTA M7-131 DIESEL

24 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—1103 rpm) | | | | | | |
| 126.25 (94.15) | 2201 | 8.29 (31.38) | 0.460 (0.280) | 15.23 (3.00) | 0.19 (0.72) | Fuel used during active exhaust regeneration-0.27 gal (1.01 l) (see note 1, p.2) |
| Standard Power Take-off Speed (1000 rpm) | | | | | | |
| 124.33 (92.71) | 1995 | 7.73 (29.28) | 0.436 (0.265) | 16.07 (3.17) | 0.21 (0.80) | |

VARYING POWER AND FUEL CONSUMPTION

| | | | | | | |
|-------------------|------|-----------------|--------------------|-----------------|----------------|-----------------------|
| 126.25 (94.15) | 2201 | 8.29 (31.38) | 0.460 (0.280) | 15.23 (3.00) | 0.19 (0.72) | Air temperature |
| 109.36 (81.55) | 2239 | 7.57 (28.64) | 0.484 (0.295) | 14.45 (2.85) | 0.16 (0.60) | 73°F (23°C) |
| 83.06 (61.94) | 2267 | 6.39 (24.20) | 0.539 (0.328) | 13.00 (2.56) | 0.15 (0.55) | Relative humidity |
| 55.94 (41.71) | 2293 | 5.59 (21.18) | 0.700 (0.426) | 10.00 (1.97) | 0.11 (0.43) | 45% |
| 28.48 (21.24) | 2325 | 4.36 (16.49) | 1.071 (0.651) | 6.54 (1.29) | 0.14 (0.53) | Barometer |
| 1.31 (0.98) | 2356 | 3.16 (11.96) | 16.924 (10.295) | 0.41 (0.08) | 0.08 (0.30) | 28.78" Hg (97.47 kPa) |

Maximum torque - 406 lb.-ft. (551 Nm) at 1201 rpm

Maximum torque rise - 34.9%

Torque rise at 1760 engine rpm - 21%

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) | D.E.F Consumption lb/hp.hr (kg/kW.h) | Temp. °F(°C) cool- ing med | Barom. inch Hg (kPa) |
|--|--------------------------------|------------------------|---------------------------------|-----------|---|---|-------------------------------------|-------------------------------|
| Power at Rated Engine Speed—6th (B2) Gear | | | | | | | | |
| 102.90 (76.73) | 7986 (35.52) | 4.83 (7.77) | 2195 | 3.6 | 0.508 (0.309) | 13.79 (2.72) | 0.017 (0.010) | 196 (91) |
| 75% of Pull at Rated Engine Speed—6th (B2) Gear | | | | | | | | |
| 80.54 (60.06) | 6002 (26.70) | 5.03 (8.10) | 2252 | 2.2 | 0.560 (0.341) | 12.50 (2.46) | 0.015 (0.009) | 189 (87) |
| 50% of Pull at Rated Engine Speed—6th (B2) Gear | | | | | | | | |
| 55.06 (41.06) | 4011 (17.84) | 5.15 (8.29) | 2289 | 1.5 | 0.729 (0.443) | 9.61 (1.89) | 0.015 (0.009) | 188 (87) |
| 75% of Pull at Reduced Engine Speed—9th (B4) Gear | | | | | | | | |
| 80.75 (60.22) | 5972 (26.56) | 5.07 (8.16) | 1581 | 2.2 | 0.465 (0.283) | 15.05 (2.97) | 0.017 (0.010) | 187 (86) |
| 50% of Pull at Reduced Engine Speed—9th (B4) Gear | | | | | | | | |
| 54.90 (40.94) | 3998 (17.78) | 5.15 (8.29) | 1595 | 1.5 | 0.539 (0.328) | 12.99 (2.56) | 0.011 (0.007) | 186 (85) |

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

Dates of tests: May 11 - 19, 2017

Manufacturer: Kubota Farm Machinery Europe, SAS Route de Socx, 59380 Bierne France

CONSUMABLE FLUIDS, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8411 **Fuel weight** 7.003 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** Kubota Super UDT2 fluid **Front axle lubricant** Kubota Super UDT2 fluid **Total time engine was operated:** 18.0 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.** *3G1.0350 **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 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: 55.8 - 58.1 lb/h (25.3 - 26.3 kg/h) **High idle:** 2350 - 2400 rpm **Turbo boost:** nominal 12.3 - 13.8 psi (85 - 95 kPa) as measured 13.3 psi (92 kPa)

CHASSIS: Type front wheel assist **Serial No.** M7131P10116 **Tread width** rear 60.0" (1524 mm) to 120.0" (3048 mm) front 60.0" (1524 mm) to 76.5" (1942 mm) **Wheelbase** 107.1" (2720 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled power shift **Nominal travel speeds mph (km/h)** first 2.29 (3.68) second 2.75 (4.42) third 3.28 (5.28) fourth 3.94 (6.34) fifth 4.12 (6.63) sixth 4.94 (7.95) seventh 5.92 (9.52) eighth 6.61 (10.64) ninth 7.09 (11.41) tenth 7.92 (12.75) eleventh 9.48 (15.26) twelfth 9.96 (16.03) thirteenth 11.37 (18.30) fourteenth 11.94 (19.21) fifteenth 13.70 (22.04) sixteenth 14.29 (23.00) seventeenth 16.42 (26.42) eighteenth 17.14 (27.58) nineteenth 19.65 (31.62) twentieth 20.95 (33.72) twenty-first 22.56 (37.92) twenty-second 24.86 (40.00) twenty-third 24.86 (40.00) twenty-fourth 24.86 (40.00) electronically limited

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) |
|---------------------|--------------------------------|------------------------|---------------------------------|-----------|---|-----------------------|---|------------------------------------|--------------------|-------------------------------|
| 1st(A1) Gear | | | | | | | | | | |
| 88.18 (65.75) | 15598 (69.38) | 2.12 (3.41) | 2233 | 11.8 | 0.552 (0.336) | 12.70 (2.50) | 0.014 (0.008) | 192 (89) | 60 (16) | 28.67 (97.09) |
| 2nd(A2) Gear | | | | | | | | | | |
| 100.54 (74.97) | 14596 (64.93) | 2.58 (4.15) | 2195 | 8.7 | 0.519 (0.316) | 13.49 (2.66) | NA (NA) | 195 (90) | 60 (16) | 28.67 (97.09) |
| 3rd(A3) Gear | | | | | | | | | | |
| 101.96 (76.03) | 12121 (53.92) | 3.16 (5.08) | 2195 | 5.5 | 0.510 (0.310) | 13.73 (2.71) | NA (NA) | 195 (90) | 60 (16) | 28.67 (97.09) |
| 4th(A4) Gear | | | | | | | | | | |
| 101.19 (75.45) | 9956 (44.29) | 3.81 (6.13) | 2195 | 4.5 | 0.516 (0.314) | 13.56 (2.67) | 0.020 (0.012) | 196 (91) | 60 (16) | 28.67 (97.09) |
| 5th(B1) Gear | | | | | | | | | | |
| 103.94 (77.51) | 9795 (43.57) | 3.98 (6.41) | 2194 | 4.4 | 0.502 (0.305) | 13.95 (2.75) | 0.015 (0.009) | 195 (91) | 59 (15) | 28.66 (97.05) |
| 6th(B2) Gear | | | | | | | | | | |
| 102.90 (76.73) | 7986 (35.52) | 4.83 (7.77) | 2195 | 3.6 | 0.508 (0.309) | 13.79 (2.72) | 0.017 (0.010) | 196 (91) | 59 (15) | 28.66 (97.05) |
| 7th(B3) Gear | | | | | | | | | | |
| 102.45 (76.40) | 6646 (29.56) | 5.79 (9.31) | 2195 | 3.3 | 0.511 (0.311) | 13.71 (2.70) | 0.015 (0.009) | 197 (91) | 59 (15) | 28.65 (97.03) |
| 8th(C1) Gear | | | | | | | | | | |
| 102.88 (76.71) | 5950 (26.46) | 6.49 (10.44) | 2195 | 3.1 | 0.509 (0.310) | 13.75 (2.71) | 0.016 (0.009) | 197 (92) | 59 (15) | 28.65 (97.03) |
| 9th(B4) Gear | | | | | | | | | | |
| 100.36 (74.83) | 5339 (23.75) | 7.05 (11.35) | 2195 | 2.1 | 0.519 (0.316) | 13.49 (2.66) | 0.019 (0.012) | 198 (92) | 54 (12) | 28.74 (97.33) |
| 10th(C2) Gear | | | | | | | | | | |
| 99.55 (74.23) | 4727 (21.02) | 7.90 (12.71) | 2195 | 1.7 | 0.522 (0.317) | 13.43 (2.64) | 0.021 (0.013) | 198 (92) | 54 (12) | 28.74 (97.33) |
| 11th(C3) Gear | | | | | | | | | | |
| 97.68 (72.84) | 3868 (17.21) | 9.47 (15.24) | 2193 | 1.4 | 0.533 (0.324) | 13.14 (2.59) | 0.017 (0.010) | 197 (92) | 54 (12) | 28.74 (97.33) |

reverse 2.61 (4.20), 3.12 (5.03), 3.57 (5.75), 4.29 (6.90), 4.70 (7.56), 5.63 (9.06), 6.44 (10.36), 7.53 (12.12), 7.72 (12.42), 9.03 (14.53), 10.33 (16.62), 11.35 (18.26), 12.38 (19.93), 13.61 (21.90), 15.57 (25.05) 15.61 (25.12), 18.66 (30.03), 18.71 (30.11), 21.40 (34.44), 23.89 (38.44), 24.86 (40.00), 24.86 (40.00) 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** 540 rpm at 2005 or 1608 engine rpm and 1000 rpm at 1995 or 1600 engine rpm **Unladen tractor mass** 15640 lb (7094 kg)

NOTE 1: The manufacturer declares that the average time between active regenerations is 13 hours.

NOTE 2: This tractor has a power management system that provides an engine power increase when the PTO is engaged and for travel speeds of 12 mph (20 km/h) and higher.

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 remote hydraulic flow claim of 21 GPM (80 l/min) with fixed displacement pump was 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. **2176**, Nebraska Summary 1090, September 25, 2017.

Roger M. Hoy
Director

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

TRACTOR SOUND LEVEL WITH CAB

| | Front Wheel Drive Engaged dB(A) | Disengaged dB(A) |
|-----------------------------|---------------------------------------|---------------------|
| At no load in 6th (B2) gear | 70.2 | 69.5 |
| Bystander in 21st (E4) gear | | 80.8 |

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 480/80R42;***;14(95)
Two 420/85R28;***;14(95)
16.5 in (420 mm)
9130 lb (4141 kg)
6685 lb (3032 kg)
15815 lb (7173 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) |
| 114.46 (85.36) | 1600 | 6.74 (25.53) | 0.413 (0.251) | 16.97 (3.34) | 0.41 (1.56) |
| 85.77 (63.96) | 1598 | 5.33 (20.18) | 0.435 (0.265) | 16.09 (3.17) | 0.25 (0.95) |
| 57.01 (42.51) | 1591 | 4.08 (15.44) | 0.501 (0.305) | 13.97 (2.75) | 0.07 (0.26) |
| 28.65 (21.37) | 1605 | 2.80 (10.61) | 0.685 (0.417) | 10.22 (2.01) | 0.04 (0.14) |
| 1.09 (0.81) | 1617 | 1.59 (6.02) | 10.226 (6.220) | 0.68 (0.13) | 0.03 (0.10) |

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) |
| 114.53 (85.40) | 1997 | 7.21 (27.28) | 0.441 (0.268) | 15.89 (3.13) | 0.21 (0.80) |
| 86.00 (64.13) | 1997 | 5.82 (22.03) | 0.474 (0.288) | 14.78 (2.91) | 0.13 (0.49) |
| 57.04 (42.54) | 1984 | 4.67 (17.67) | 0.573 (0.348) | 12.22 (2.41) | 0.07 (0.26) |
| 28.63 (21.35) | 1999 | 3.44 (13.01) | 0.841 (0.511) | 8.33 (1.64) | 0.04 (0.16) |
| 0.93 (0.69) | 2015 | 2.20 (8.34) | 16.603 (10.099) | 0.42 (0.08) | 0.03 (0.10) |

HYDRAULIC PERFORMANCE

CATEGORY: III

Quick Attach: None

OECD Static test

Maximum force exerted through whole range: Lift cylinders
14372 lbs (63.9 kN) 2 x 100 mm

i) Maximum observed pressure: 2825 psi (195 bar)
three outlet sets combined

ii) Pump delivery rate at minimum pressure and rated engine speed: 30.6 GPM (116.0 l/min)

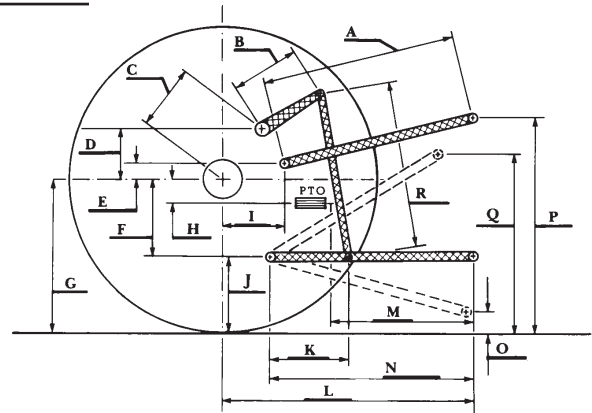
iii) Pump delivery rate at maximum hydraulic power: 29.6 GPM (112.0 l/min)
 Delivery pressure: 2573 psi (177 bar)
 Power: 44.4 HP (33.1 kW)

ii) Pump delivery rate at minimum pressure and rated engine speed: 26.2 GPM (99.0 l/min)

iii) Pump delivery rate at maximum hydraulic power: 25.0 GPM (94.6 l/min)
 Delivery pressure: 2530 psi (174 bar)
 Power: 36.9 HP (27.5 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD

| | inch | mm |
|---|------|------|
| A | 28.7 | 730 |
| B | 12.9 | 328 |
| C | 19.4 | 492 |
| D | 17.5 | 445 |
| E | 13.0 | 330 |
| F | 9.1 | 230 |
| G | 34.5 | 875 |
| H | 9.8 | 249 |
| I | 16.6 | 422 |
| J | 25.4 | 645 |
| K | 18.7 | 475 |
| L | 46.4 | 1178 |
| M | 25.0 | 635 |
| N | 38.5 | 978 |
| O | 9.1 | 230 |
| P | 52.4 | 1330 |
| Q | 38.8 | 985 |
| R | 32.9 | 835 |



KUBOTA M7-131 DIESEL

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