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2017

Test 2178: Kubota M7-171

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2178—SUMMARY 1092

KUBOTA M7-171 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)						
145.93 (108.82)	2201	9.56 (36.19)	0.459 (0.279)	15.26 (3.01)	0.20 (0.75)	Fuel used during active exhaust regeneration-0.12 gal (0.46 l) (see note 1, p.2)
Maximum Power (1 hour)						
148.60 (110.81)	2101	9.44 (35.72)	0.445 (0.271)	15.75 (3.10)	0.21 (0.80)	
Standard Power Take-off Speed (1000 rpm)						
146.39 (109.16)	1995	9.13 (34.55)	0.437 (0.266)	16.04 (3.16)	0.19 (0.71)	

VARYING POWER AND FUEL CONSUMPTION

145.93 (108.82)	2201	9.56 (36.19)	0.459 (0.279)	15.26 (3.01)	0.20 (0.75)	Air temperature
126.62 (94.42)	2244	8.61 (32.59)	0.476 (0.290)	14.71 (2.90)	0.18 (0.69)	73°F (23°C)
96.22 (71.75)	2274	7.20 (27.24)	0.524 (0.319)	13.37 (2.63)	0.17 (0.63)	Relative humidity
64.88 (48.38)	2301	6.15 (23.29)	0.664 (0.404)	10.55 (2.08)	0.13 (0.51)	59%
32.98 (24.59)	2331	4.66 (17.65)	0.990 (0.602)	7.07 (1.39)	0.08 (0.32)	Barometer
1.31 (0.98)	2352	3.20 (12.12)	17.086 (10.393)	0.41 (0.08)	0.05 (0.20)	28.58" Hg (96.80 kPa)

Maximum torque - 491 lb.-ft. (665 Nm) at 1201 rpm

Maximum torque rise - 40.9%

Torque rise at 1760 engine rpm - 22%

Power increase at 2101 engine rpm - 1.8%

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 bulb	Air inch Hg (kPa)	Barom.
Power at Rated Engine Speed—7th (B3) Gear										
137.69 (102.68)	8857 (39.40)	5.83 (9.38)	2195	3.4	0.483 (0.294)	14.49 (2.86)	0.016 (0.009)	196 (91)	69 (20)	28.51 (96.55)
75% of Pull at Rated Engine Speed—7th (B3) Gear										
106.83 (79.66)	6627 (29.48)	6.05 (9.73)	2258	2.6	0.523 (0.318)	13.38 (2.64)	0.015 (0.009)	195 (91)	82 (28)	28.50 (96.51)
50% of Pull at Rated Engine Speed—7th (B3) Gear										
72.95 (54.40)	4424 (19.68)	6.18 (9.95)	2291	1.7	0.625 (0.380)	11.21 (2.21)	0.021 (0.013)	195 (91)	86 (30)	28.49 (96.48)
75% of Pull at Reduced Engine Speed—10th (C2) Gear										
106.57 (79.47)	6669 (29.67)	5.99 (9.64)	1670	2.7	0.458 (0.279)	15.29 (3.01)	0.014 (0.008)	192 (89)	83 (28)	28.50 (96.51)
50% of Pull at Reduced Engine Speed—10th (C2) Gear										
72.80 (54.29)	4455 (19.81)	6.13 (9.87)	1694	1.7	0.510 (0.310)	13.73 (2.71)	0.012 (0.007)	190 (88)	86 (30)	28.49 (96.48)

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

Dates of tests: May 10 - 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:** 21.5 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.** *3G1.0519 **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: 64.8 - 67.5 lb/h (29.4 - 30.6 kg/h) **High idle:** 2350 - 2400 rpm **Turbo boost:** nominal 13.8 - 15.2 psi (95 - 105 kPa) as measured 14.6 psi (101 kPa)

CHASSIS: Type front wheel assist with duals **Serial No.** M7171P10501 **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)	D.E.F Consumption Hp.hr/gal (kW.hr/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
2nd(A2) Gear										
115.41 (86.06)	17121 (76.16)	2.53 (4.07)	2229	12.3	0.539 (0.328)	12.99 (2.56)	NA (NA)	196 (91)	77 (25)	28.35 (96.00)
3rd(A3) Gear										
131.37 (97.96)	16010 (71.22)	3.08 (4.96)	2197	8.0	0.507 (0.308)	13.81 (2.72)	0.029 (0.018)	196 (91)	79 (26)	28.35 (96.00)
4th(A4) Gear										
131.86 (98.32)	13042 (58.01)	3.79 (6.10)	2195	5.7	0.503 (0.306)	13.92 (2.74)	NA (NA)	196 (91)	79 (26)	28.33 (96.94)
5th(B1) Gear										
137.67 (102.66)	12983 (57.75)	3.98 (6.41)	2194	5.4	0.484 (0.295)	14.45 (2.85)	NA (NA)	196 (91)	77 (25)	28.52 (96.58)
6th(B2) Gear										
136.29 (101.63)	10580 (47.06)	4.83 (7.77)	2194	4.0	0.490 (0.298)	14.28 (2.81)	0.025 (0.015)	196 (91)	75 (24)	28.52 (96.58)
7th(B3) Gear										
137.69 (102.68)	8857 (39.40)	5.83 (9.38)	2195	3.4	0.483 (0.294)	14.49 (2.86)	0.016 (0.009)	196 (91)	69 (20)	28.51 (96.55)
8th(C1) Gear										
138.09 (102.97)	7917 (35.21)	6.54 (10.53)	2195	3.0	0.483 (0.294)	14.51 (2.86)	0.024 (0.014)	196 (91)	70 (21)	28.51 (96.55)
9th(B4) Gear										
134.05 (99.96)	7145 (31.78)	7.04 (11.33)	2194	2.6	0.496 (0.302)	14.12 (2.78)	0.036 (0.022)	196 (91)	71 (22)	28.52 (96.58)
10th(C2) Gear										
132.51 (98.81)	6303 (28.04)	7.88 (12.68)	2194	2.3	0.502 (0.305)	13.96 (2.75)	0.030 (0.018)	197 (91)	77 (25)	28.51 (96.55)
11th(C3) Gear										
131.45 (98.02)	5202 (23.14)	9.48 (15.25)	2195	1.8	0.506 (0.308)	13.84 (2.73)	0.025 (0.016)	196 (91)	78 (25)	28.51 (96.55)

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), 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** 17475 lb (7926 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 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. **2178**, Nebraska Summary 1092, 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	76.2	75.7
Bystander in 21st (E4) gear		83.4

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 480/80R42;***;12(85)
Two 420/85R28;***;14(95)
18.0 in (455 mm)
10940 lb (4962 kg)
6710 lb (3044 kg)
17650 lb (8006 kg)

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)
2nd(A2) Gear										
115.28 (85.96)	17111 (76.11)	2.53 (4.07)	2230	12.5	0.539 (0.328)	12.98 (2.56)	NA (NA)	195 (91)	78 (25)	28.35 (96.00)
3rd(A3) Gear										
130.95 (97.65)	16359 (72.77)	3.01 (4.84)	2159	8.7	0.506 (0.308)	13.84 (2.73)	0.013 (0.008)	196 (91)	79 (26)	28.33 (95.94)
4th(A4) Gear										
132.93 (99.12)	13817 (61.46)	3.61 (5.81)	2100	6.4	0.493 (0.300)	14.20 (2.80)	0.013 (0.008)	196 (91)	80 (27)	28.33 (95.94)
5th(B1) Gear										
137.82 (102.77)	13652 (60.73)	3.79 (6.10)	2100	5.8	0.478 (0.291)	14.66 (2.89)	0.013 (0.008)	196 (91)	77 (25)	28.51 (96.55)
6th(B2) Gear										
136.81 (102.02)	11124 (49.48)	4.61 (7.42)	2100	4.4	0.482 (0.293)	14.54 (2.86)	0.014 (0.008)	196 (91)	76 (25)	28.52 (96.58)
7th(B3) Gear										
139.05 (103.69)	9366 (41.66)	5.57 (8.96)	2100	3.6	0.473 (0.288)	14.81 (2.92)	0.012 (0.007)	195 (91)	70 (21)	28.51 (96.55)
8th(C1) Gear										
138.25 (103.09)	8296 (36.90)	6.25 (10.06)	2100	3.3	0.476 (0.289)	14.73 (2.90)	0.013 (0.008)	195 (91)	71 (22)	28.52 (96.58)
9th(B4) Gear										
135.85 (101.30)	7578 (33.71)	6.72 (10.81)	2100	2.9	0.484 (0.294)	14.48 (2.85)	0.012 (0.007)	195 (91)	72 (22)	28.52 (96.58)
10th(C2) Gear										
133.29 (99.39)	6632 (29.50)	7.54 (12.13)	2100	2.4	0.493 (0.300)	14.22 (2.80)	0.014 (0.008)	196 (91)	77 (25)	28.51 (96.55)
11th(C3) Gear										
133.78 (99.76)	5541 (24.65)	9.05 (14.56)	2099	2.0	0.491 (0.299)	14.27 (2.81)	0.014 (0.008)	196 (91)	78 (25)	28.51 (96.55)

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)
136.59 (101.85)	1600	7.91 (29.95)	0.406 (0.247)	17.26 (3.40)	0.24 (0.90)
102.43 (76.38)	1602	6.17 (23.37)	0.422 (0.257)	16.59 (3.27)	0.18 (0.67)
68.62 (51.17)	1606	4.58 (17.35)	0.468 (0.284)	14.97 (2.95)	0.10 (0.37)
33.98 (25.34)	1594	3.09 (11.71)	0.638 (0.388)	10.98 (2.16)	0.04 (0.16)
1.06 (0.79)	1606	1.53 (5.79)	10.141 (6.168)	0.69 (0.14)	0.03 (0.13)

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)
136.44 (101.74)	1992	8.45 (32.00)	0.434 (0.264)	16.14 (3.18)	0.21 (0.78)
102.40 (76.36)	1993	6.65 (25.19)	0.455 (0.277)	15.39 (3.03)	0.16 (0.59)
68.77 (51.28)	2006	5.30 (20.05)	0.539 (0.328)	12.98 (2.56)	0.08 (0.29)
34.15 (25.47)	1996	3.70 (14.00)	0.758 (0.461)	9.24 (1.82)	0.05 (0.17)
0.87 (0.65)	1993	2.10 (7.95)	16.975 (10.326)	0.41 (0.08)	0.03 (0.12)

HYDRAULIC PERFORMANCE

CATEGORY: III

Quick Attach: None

OECD Static test

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

i) Maximum observed pressure: 2850 psi (197 bar)
three outlet sets combined

ii) Pump delivery rate at minimum pressure and rated engine speed: 29.9 GPM (113.3 l/min)

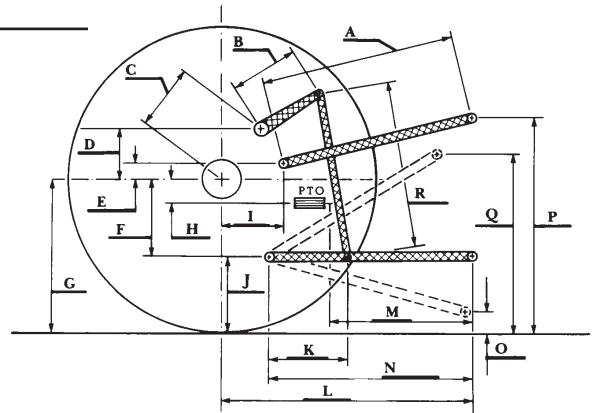
iii) Pump delivery rate at maximum hydraulic power: 28.3 GPM (107.0 l/min)
Delivery pressure: 2590 psi (179 bar)
Power: 42.7 HP (31.9 kW)
single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed: 25.7 GPM (97.4 l/min)

iii) Pump delivery rate at maximum hydraulic power: 25.2 GPM (95.5 l/min)
Delivery pressure: 2548 psi (176 bar)
Power: 37.5 HP (28.0 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 M7-171 DIESEL

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