**NEBRASKA TRACTOR TEST 1944**

**KUBOTA M108S DIESEL**

**16 SPEED**

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### POWER TAKE-OFF PERFORMANCE

<table>
<thead>
<tr>
<th>Power HP (kW)</th>
<th>Crankshaft speed rpm</th>
<th>Gal/hr (l/h)</th>
<th>lbhp.hr (kg/AW.h)</th>
<th>Hp.hr/gal (kW/l)</th>
<th>Mean Atmospheric Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>101.74</strong> (75.87)</td>
<td>2601</td>
<td>6.27</td>
<td>0.430</td>
<td>16.22</td>
<td><strong>(3.19)</strong></td>
</tr>
<tr>
<td><strong>103.17</strong> (76.93)</td>
<td>2499</td>
<td>6.22</td>
<td>0.421</td>
<td>16.59</td>
<td><strong>(3.27)</strong></td>
</tr>
<tr>
<td><strong>99.27</strong> (74.03)</td>
<td>2205</td>
<td>5.79</td>
<td>0.407</td>
<td>17.16</td>
<td><strong>(3.38)</strong></td>
</tr>
</tbody>
</table>

### MAXIMUM POWER AND FUEL CONSUMPTION

<table>
<thead>
<tr>
<th>Engine Speed</th>
<th>Gal/hr (l/h)</th>
<th>lbhp.hr (kg/AW.h)</th>
<th>Hp.hr/gal (kW/l)</th>
<th>Air temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Engine Speed (PTO speed—657 rpm)</td>
<td>2601</td>
<td>6.27</td>
<td>0.430</td>
<td>16.22</td>
</tr>
<tr>
<td>Maximum Power</td>
<td>2499</td>
<td>6.22</td>
<td>0.421</td>
<td>16.59</td>
</tr>
<tr>
<td>Standard Power Take-off (540 rpm)</td>
<td>2205</td>
<td>5.79</td>
<td>0.407</td>
<td>17.16</td>
</tr>
</tbody>
</table>

### VARYING POWER AND FUEL CONSUMPTION

<table>
<thead>
<tr>
<th>Engine Speed</th>
<th>Gal/hr (l/h)</th>
<th>lbhp.hr (kg/AW.h)</th>
<th>Hp.hr/gal (kW/l)</th>
<th>Air temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>101.74 (75.87)</td>
<td>2601</td>
<td>6.27</td>
<td>0.430</td>
<td>16.22</td>
</tr>
<tr>
<td>87.84 (65.90)</td>
<td>2643</td>
<td>5.58</td>
<td>0.443</td>
<td>15.75</td>
</tr>
<tr>
<td>66.93 (49.91)</td>
<td>2682</td>
<td>4.37</td>
<td>0.477</td>
<td>14.64</td>
</tr>
<tr>
<td>45.20 (33.71)</td>
<td>2717</td>
<td>3.45</td>
<td>0.533</td>
<td>13.09</td>
</tr>
<tr>
<td>22.81 (17.01)</td>
<td>2747</td>
<td>2.38</td>
<td>0.728</td>
<td>9.59</td>
</tr>
<tr>
<td>1.17 (0.87)</td>
<td>2781</td>
<td>1.39</td>
<td>0.812</td>
<td>0.84</td>
</tr>
</tbody>
</table>

Maximum torque: 250 lb-ft. (339 Nm) at 1649 rpm

Torque rise: 2099 rpm - 16%

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### TRACTOR SOUND LEVEL WITH CAB

<table>
<thead>
<tr>
<th>Condition</th>
<th>Disengaged dB(A)</th>
<th>Engaged dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armored in 7th (HHL) gear</td>
<td>77.8</td>
<td>78.9</td>
</tr>
<tr>
<td>Restored in 16th (HH) gear</td>
<td>84.8</td>
<td>—</td>
</tr>
</tbody>
</table>

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### TIRES AND WEIGHT

<table>
<thead>
<tr>
<th>Tire Type</th>
<th>Width</th>
<th>Height</th>
<th>Ply</th>
<th>psi</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rear</strong></td>
<td>6.22</td>
<td>1.91</td>
<td>16</td>
<td>16.59 kg</td>
<td></td>
</tr>
<tr>
<td><strong>Front</strong></td>
<td>6.27</td>
<td>1.91</td>
<td>16</td>
<td>16.59 kg</td>
<td></td>
</tr>
</tbody>
</table>

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

**Dates of tests:** November 18 - 21, 2008

**Manufacturer:** Kubota Corporation, Sakai Plant, 64, Ishizu-Kitamachi, Sakai-ku, Sakai-City, Osaka, Japan

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Specific gravity converted to 60°F/60°F 0.8588 Fuel weight 6.977 lbs/gal (0.836 kg/l) Oil SAE 10W30 API service classification CF Transmission and hydraulic lubricant Kubota UDT 2 fluid Front axle lubricant SAE 90 gear oil

**Total time engine was operated:** 13.0 hours

**ENGINE:** Make Kubota Diesel Type four cylinder vertical with turbocharger and air to air intercooler Serial No. 853679 Crankshaft lengthwise Rated engine speed 2600 Bore and stroke 3.937" x 4.724" (100.0 mm x 120.0 mm) Compression ratio 17.5 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 Muffler underhood Exhaust vertical Cooling medium temperature control one thermostat

**ENGINE OPERATING PARAMETERS:**

- **Fuel rate:** 42.1 - 45.1 lb/h (19.1 - 20.5 kg/h) High idle: 2700 - 2800 rpm Turbo boost: nominal 9.7-11.1 psi (67 - 77 kPa) as measured 10.8 psi (74 kPa)

- **CHASSIS:** Type Front wheel assist Serial No. 70086 Tread rear 68.1" (1730 mm) to 80.1" (2035 mm) front 62.2" (1580 mm) to 66.1" (1680 mm) Wheelbase 95.9" (2435 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio Nominal travel speeds mph (km/h) first 1.28 (2.06) second 1.63 (2.62) third 2.00 (3.23) fourth 2.46 (3.96) fifth 3.15 (5.07) sixth 4.01 (6.45) seventh 4.46 (7.19) eighth 4.94 (7.95) ninth 5.69 (9.16) tenth 6.05 (9.74) eleventh 7.02 (11.29) twelfth 8.60 (13.84) thirteenth 11.00 (17.70) fourteenth 14.01 (22.55) fifteenth 17.26 (27.77) sixteenth 21.15 (34.04) reverse 1.29 (2.08) 1.65 (2.65) 2.03 (3.26) 2.48 (3.99) 3.18 (5.11) 4.04 (6.51) 4.51 (7.26) 4.98 (8.02) 5.74 (9.24) 6.11 (9.83) 7.07 (11.38) 8.67 (13.95) 11.10 (17.86) 14.13 (22.74) 17.41 (28.01) 21.34 (34.34) 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 2205 engine rpm Unladen tractor mass 8605 lb (3903 kg)
HYDRAULIC PERFORMANCE

CATEGORY: II
Quick attach: None
OECD Static test
Maximum force exerted through whole range: 3960 lbs (17.4 kN)
5765 lbs (25.6 kN) (with 2 assist cylinders)
i) Sustained pressure of the open relief valve: 2812 psi (194 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed: 16.0 GPM (60.6 l/min)
iii) Pump delivery rate at maximum hydraulic power: 14.0 GPM (53.0 l/min)

THREE POINT HITCH PERFORMANCE (SAE Static test)
Observed maximum pressure psi (bar): 2800 (185)
Location: lift cylinder
Hydraulic oil temperature: °F (°C): 150 (65)
Location: hydraulic sump
Category: II
Quick attach: none

SAE Static Test—System pressure 2520 psi (174 Bar)
Hitch point distance to ground level in. (mm): 8.0 (203) 15.0 (381) 22.0 (559) 29.0 (737) 36.0 (914)
Lift force on frame lb (kN): 30.9 (1.3) 25.5 (1.1) 21.3 (0.9) 23.8 (1.0) 20.8 (0.9)

SAE Static Test—System pressure 2520 psi (174 Bar) (2 assist cylinders)
Hitch point distance to ground level in. (mm): 8.0 (203) 15.0 (381) 22.0 (559) 29.0 (737) 36.0 (917)
Lift force on frame lb (kN): 11871 9450 8451 8280 7007

S A E T e s t | O E C D T e s t
---|---
A | 28.3 718 | 28.5 724
B | 9.8 250 | 9.8 250
C | 12.2 311 | 12.2 311
D | 11.9 303 | 11.9 303
E | 12.6 321 | 12.6 321
F | 6.9 176 | 6.9 176
G | 30.3 770 | 30.3 770
H | 0.4 10 | 0.4 10
I | 12.3 312 | 12.3 312
J | 23.4 594 | 23.4 594
K | 18.7 474 | 18.7 474
L | 40.0 1015 | 40.0 1015
M | 24.0 610 | 24.0 610
N | 35.4 900 | 35.4 900
O | 8.0 203 | 8.0 203
P | 42.4 1077 | 47.4 1204
Q | 34.8 883 | 34.8 883
R | 24.5 622 | 24.5 622

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. This tractor did not meet the manufacturer's claims of 17.2 GPM (65.0 lpm) hydraulic flow nor 3 point lift of 7490 lbs (3400 kg) with optional 2 assist cylinders. For the maximum power tests, the fuel temperature at the fuel filter was maintained at 120°F (49°C).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1944, February 5, 2009.

Roger M. Hoy
Director

M.F. Kocher
J.A. Smith
V.I. Adamchuk

Board of Tractor Test Engineers

Kubota M108S Diesel

Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln