May 2008

Test007: Case 20-30

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UNIVERSITY OF NEBRASKA
AGRICULTURAL ENGINEERING DEPARTMENT
UNIVERSITY FARM, LINCOLN

Report of Official Tractor Test No. 7

Dates of test Apr. 10 to May 7, 1920

Name, model and rating of tractor Case 20-40

Serial No. Engine 22518 Serial No. Chassis Rated Speed 475 R.P.M.

Manufacturer J.I. Case Threshing Machine Co., Racine Wis.

Tractor equipment used K.W. Model HK magneto, Kingston Model E carburetor

Style and dimensions of wheel lugs Malleable 1 11 inches high 181 inches long, 8 inch extension rims.

Brake Horse Power Tests

<table>
<thead>
<tr>
<th>Horse Power Developed</th>
<th>Crank Shaft Speed R.P.M.</th>
<th>Length of Test Min.</th>
<th>Fuel Consumption</th>
<th>Water Consumption</th>
<th>Barometric Pressure Inches Mercury</th>
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</thead>
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</tbody>
</table>

RATED LOAD TEST

- 40.29 482 120 Kero 7.124 5.66 0.04 5.50 5.54 163 64 67 28.3
  Belt Slippage 2.25 %

VARYING LOAD TEST

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</thead>
</table>

Aver. 40.14 480 10 Kero
40.43 467.5 117
10.49 494 11
20.44 491 11
31.21 491.5 11
24.31 467 60
4.996 4.37 None 1.82 1.82 167 66 67 28.3

MAXIMUM LOAD TEST

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</table>

- 42.80 473 60 Kero 7.678 5.57 0.07 3.55 3.72 165 62 92 28.4
Belt Slippage 2.41 %

HALF LOAD TEST

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</thead>
</table>

- 20.57 494 60 Kero 4.644 4.43 0.24 1.60 1.84 169 72 67 28.3
Belt Slippage 1.69 %

*Taken in discharge line from engine.

Remarks The kerosene used in brake tests weighed 6.71 lbs. per gallon.

* In the varying load test it was necessary to shut off the water feed to fuel mixture for 0, and 1/4 loads. The governor hunted at 0, 1/4 and 1/2 loads.
## Drawbar Horse Power Tests

<table>
<thead>
<tr>
<th>Horse Power Developed</th>
<th>Draw Bar Pull (Pounds)</th>
<th>Speed (Miles per Hour)</th>
<th>Crank Shaft Speed (R.P.M.)</th>
<th>Slippage of Drive Wheels %</th>
<th>Fuel Consumption</th>
<th>Rated Load Test. Ten Hours (9 Hours 45 Minutes)</th>
<th>Maximum Load Test (1st 163.2 Ft., 2nd 171.8 Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>21.48</td>
<td>3987</td>
<td>2.02</td>
<td>485</td>
<td>4.76</td>
<td>Kero</td>
<td>6.345</td>
<td>3.885</td>
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<td></td>
<td>4.44</td>
<td>159.5</td>
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<td>57</td>
<td>67</td>
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<td></td>
<td>29.0</td>
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<tr>
<td>24.66</td>
<td>5537</td>
<td>1.67</td>
<td>450</td>
<td>10.13</td>
<td>Kero</td>
<td>----- Not Recorded</td>
<td>154</td>
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<td>64</td>
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<td></td>
<td>28.7</td>
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<tr>
<td>22.71</td>
<td>3273</td>
<td>2.60</td>
<td>430</td>
<td>5.40</td>
<td>&quot;</td>
<td>----- &quot;</td>
<td>156</td>
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<td></td>
<td>28.7</td>
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</tbody>
</table>

*Taken in discharge line from engine.

**Remarks**
The kerosene used in drawbar tests weighed 6.80 Lbs. per gallon.

**For computing slippage, the circumference of the drive wheels was taken at the points of the lug.

The rated load test and the first maximum test were made with the tractor in low gear. The second maximum test was made with the tractor in high gear.

The condition of the track was better than usual when these tests were made.

### Oil Consumption:

During the complete test consisting of about 40 hours running the following oil was used:

For the engine, \( 12 \frac{1}{2} \) gallons of Mobiloil BB

For the transmission, \( 1 \frac{1}{2} \) gallons of Used crank case oil.

Miscellaneous Tests: None.

Repairs and Adjustments. Endurance:

The left crank bearing was tightened after 13 hours run.

The spark plug was replaced in the front cylinder after 15 hours run, and the spark plug was replaced in the rear cylinder after about 30 hours run. The plugs removed were still good but apparently were moist which caused the engine to miss fire when it was started up.

At the end of the test the tractor was apparently in good condition. There was no indication of undue wear in any part nor of any weakness which might require early repairs.

Brief Specifications Case 20-40 H.P. Tractor.

Engine: Two cylinder opposed, horizontal, Bore 8-3/4", stroke 9", rated speed 475 r.p.m.

Chassis: Four wheel. rated speeds: low gear 2 mi. per hr., high gear 3 mi. per hr.

Total weight 13780 lbs.

General Remarks:

In the advertising literature submitted with the application for test of this tractor we find the following statement regarding horsepower capacity: "It develops a liberal reserve power over its rated horse power." We do not approve this statement for the reason that it is indefinite and therefore likely to be misleading. We also find in this advertising literature some statements and claims which cannot be directly compared with the results of this test as reported above. It is our opinion that none of these statements or claims are unreasonable or excessive.

We, the undersigned, certify that above is a true and correct report of official tractor test No. 7.

Claude R. Shedd
Engineer-in-Charge

Oscar W. Nissen
E. B. Becherer

J. W. Haney

Board of Tractor Test Engineers.