1-1-1955

Test 567: John Deere 80 Diesel

Tractor Test Museum

University of Nebraska

Follow this and additional works at: https://digitalcommons.unl.edu/tractormuseumlit

Part of the Applied Mechanics Commons

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.
BELT HORSEPOWER TESTS

<table>
<thead>
<tr>
<th>Hp</th>
<th>Crack shaft speed rpm</th>
<th>Fuel Consumption</th>
<th>Water used gal per hr</th>
<th>Temp Deg F</th>
<th>Barometer inches of mercury</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Gal per hour</td>
<td>Hydr per gal</td>
<td>Lb per hp-hr</td>
<td></td>
</tr>
</tbody>
</table>

TESTS B & C—100% MAXIMUM LOAD—TWO HOURS

65.33 | 1125 | 3.717 | 17.58 | 0.599 | 0.00 | 0.00 | 158 | 53 | 28.709 |

TEST D—Rated LOAD—ONE HOUR

57.52 | 1126 | 3.225 | 17.84 | 0.594 | 0.00 | 0.00 | 151 | 55 | 28.70 |

TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)

57.60 | 1126 | 3.231 | 17.83 | 0.594 | 0.00 | 0.00 | 151 | 55 | 28.70 |

DRAWBAR HORSEPOWER TESTS

<table>
<thead>
<tr>
<th>Hp</th>
<th>Drawbar pull lb</th>
<th>Speed miles per hr</th>
<th>Crack shaft speed rpm</th>
<th>Slip of drive wheels %</th>
<th>Fuel Consumption</th>
<th>Water used gal per hr-hr</th>
<th>Temp Deg F</th>
<th>Barometer inches of mercury</th>
</tr>
</thead>
</table>

TEST H—Rated LOAD—Ten HOURS—3rd Gear

46.33 | 3979 | 4.41 | 1125 | 6.19 | 2.934 | 15.96 | 0.440 | 0.08 | 150 | 61 | 28.418 |

TESTS F & G—100% Maximum LOAD

40.58 | 7594 | 2.06 | 1126 | 14.17 | 1st gear (part throttle) | 135 | 55 | 29.52 | 29.80 |

57.25 | 6587 | 3.26 | 1124 | 12.28 | 2nd gear | 150 | 50 | 28.76 | 28.76 |

60.04 | 5161 | 3.36 | 1129 | 7.60 | 3rd gear | 151 | 48 | 28.75 | 28.75 |

60.26 | 4412 | 5.12 | 1124 | 7.05 | 4th gear | 149 | 52 | 28.75 | 28.75 |

60.56 | 3416 | 6.63 | 1123 | 5.36 | 5th gear | 148 | 56 | 28.75 | 28.75 |

56.88 | 1708 | 12.38 | 1131 | 2.85 | 6th gear | 132 | 55 | 28.75 | 28.75 |

TEST J—Operating Maximum LOAD

57.38 | 5141 | 4.19 | 1128 | 12.80 | 3rd gear (part throttle) | 148 | 47 | 28.65 | 28.65 |

TEST K—Operating Maximum LOAD

50.07 | 4899 | 3.83 | 1130 | 15.49 | 3rd gear (part throttle) | 144 | 45 | 28.65 | 28.65 |

TIRES, WHEELS AND WEIGHT

<table>
<thead>
<tr>
<th></th>
<th>Test F, G &amp; H</th>
<th>Test J</th>
<th>Test K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear wheels Type</td>
<td>Cast iron</td>
<td>Cast iron</td>
<td>Cast iron</td>
</tr>
<tr>
<td>Liquid ballast</td>
<td>932 lb each</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Added cast iron</td>
<td>560 lb each</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Rear tires No. and size</td>
<td>Two 15-34</td>
<td>Two 15-34</td>
<td>Two 14-34</td>
</tr>
<tr>
<td>Ply</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Air pressure</td>
<td>16 lb</td>
<td>16 lb</td>
<td>16 lb</td>
</tr>
<tr>
<td>Front wheels Type</td>
<td>Pressed steel</td>
<td>Pressed steel</td>
<td>Pressed steel</td>
</tr>
<tr>
<td>Liquid ballast</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Added cast iron</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Front tires No. and size</td>
<td>Two 7.50-18</td>
<td>Two 7.50-18</td>
<td>Two 7.50-18</td>
</tr>
<tr>
<td>Ply</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Air pressure</td>
<td>28 lb</td>
<td>28 lb</td>
<td>28 lb</td>
</tr>
<tr>
<td>Height of drawbar</td>
<td>19% inches</td>
<td>21 inches</td>
<td>18½ inches</td>
</tr>
<tr>
<td>Static weight Rear end</td>
<td>8540 lb</td>
<td>5556 lb</td>
<td>5485 lb</td>
</tr>
<tr>
<td>Front end</td>
<td>2770 lb</td>
<td>2780 lb</td>
<td>2765 lb</td>
</tr>
<tr>
<td>Total weight as tested with operator</td>
<td>11185 lb</td>
<td>8511 lb</td>
<td>8425 lb</td>
</tr>
</tbody>
</table>

HORSEPOWER SUMMARY

Drawbar Belt

1. Sea level (calculated) maximum horsepower (based on 60° F. and 29.92" Hg) 61.76 67.64
2. Observed maximum horsepower (tests F and B) 60.94 63.33
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly ASAE and SAE ratings) 46.32 57.49

We, the undersigned, certify that this is a true and correct report of official tractor test No. 567.

L. F. LARSEN
Engineer-In-Charge

L. W. HURLIBUT
G. W. STEINBRUEGGE
J. J. SCANNELL
Board of Tractor Test Engineers

JOHN DEERE 80 DIESEL

FUEL, OIL and TIME Diesel Fuel. Cetane No. 50 (rating taken from oil company’s typical inspection data) Weight per gallon 7.020 lb OIL. SAE 20 To motor 2.769 gal drained from motor 2.506 gal Total time motor was operated 40 hours.

CHASSIS Type Standard Serial No. 8000002 Tread width rear 64%" or 68½" from 56½" Wheel base 85½". Hydraulic control system direct engine drive with throw out lever. Advertised speeds mph first 2½ second 3½ third 4½ fourth 5½ fifth 6½ sixth 12½ reverse 3 Belt pulley diam. 12½" face 9½ rpm 1125 Belt speed 5599 rpm Clutch multiple dry disc clutch operated by hand lever. Seat upholstered seat with back rest. Brakes. Internal expanding shoes operated by two foot pedals. Equalized Power take-off direct engine drive with independent clutch steering aided by hydraulic power steering.

ENGINE Make JOHN DEERE DIESEL Type 2 cylinder horizontal Serial No. 8000002 Crankshaft mounted crosshead 1 Lubrication pressure. Bore and stroke 6¼" x 8". Rated rpm 1125 Compression ratio 16 to 1 Displacement 47½ cu. in. Port diameter valves inlet 2.300" exhaust 1.815" Governor variable speed centrifugal. Air cleaner oil wetted wire mesh. Muffler was used Oil filter replaceable impregnated paper element. Fuel filter brass wire screen in sediment bowl and two replaceable impregnated paper elements. Cooling medium temperature control thermostat.

STARTING ENGINE Make John Deere Type 4 cylinder "V". Bore and stroke 2" x 1½" Displacement 18.85 cu. in. Rated rpm 5500 Ignition battery Starter 6-volt battery.

REPAIRS AND ADJUSTMENTS No repairs or adjustments.

REMARKS All test results were determined from observed data and without allowances, additions or deductions. Tests B and F were made with fuel pump set to develop approximately 65 observed maximum horsepower and data from these tests were used in determining the horsepower to be developed in tests D and H, respectively. Tests C, D, E, G, H, I, and K were made with the same setting.
EXPLANATION OF TEST REPORT

TEST A: The manufacturer's representative operates the tractor for a minimum of 12 hours using light to heavy drawbar loads in each gear.
This serves as a period for limber up, general observation and adjustments. Adjustments that are permissible include valve tappet clearance, breaker point gap, spark plug gaps, clutch and others of a similar nature. No new parts or accessories can be installed without having mention made of it in the report.
No data are recorded during this preliminary run except the time that the engine is operated.

BELT HORSEPOWER TESTS

TEST B: The throttle valve is held wide open and the belt load on the dynamometer is adjusted so that the engine is at the rated speed recommended by the manufacturer. Carburetor, ignition timing and manifold adjustments are all set for maximum engine power.
This test is designed to determine maximum belt horsepower of the tractor at rated speed and to measure fuel consumption at the maximum power on the belt.

TEST C: For tractors with carburetors the best fuel economy does not always occur when the engine develops maximum power at rated speed. Test C is intended to allow the manufacturer's representative to select a more economical fuel setting even though there is a slight loss of power. This more practical carburetor setting is used in all later tests except test F. The throttle valve is held wide open and load adjusted to give rated rpm. Tests B and C are the same for diesel tractors, which have an altogether different fuel system.

TEST D: The throttle control lever is set so that the governor will maintain rated engine speed when rated load is applied. Rated load is 85% of 100% maximum, as obtained in test B, corrected to standard conditions.
This rating is somewhat less than the maximum belt horsepower in order that the operator may have a certain amount of reserve.

TEST E: Varying load serves to show the range of engine speeds when the engine is controlled by the governor during the following varied loads, of 20 minutes each: rated load, no load, ½ rated load, maximum load at wide open throttle valve, ¼ and ¾ rated load.
The average result of this test shows the average power and fuel consumption. Since the average tractor is subjected to varying loads, these data serve well in predicting fuel consumption and efficiency of a tractor in general use.
Torque, lb-ft at dynamometer, is obtained with wide open throttle and sufficient load is applied to give several readings.

DRAWBAR HORSEPOWER TESTS
In all drawbar tests the pull exerted by the tractor is transmitted by a hydraulic pressure cylinder to a recording instrument in the test car. All tests are made on the same dirt test course which is maintained by grading, sprinkling and rolling so that it remains very nearly the same throughout the season. The same tires, wheels and weights are used for all tests except J and K.

TEST F: A drawbar test, the results of which are used to determine the rated drawbar horsepower in test H. The carburetor is set to develop maximum power as in test B. The rated gear recommended by manufacturer as plow gear is used in this test. The drawbar load is adjusted to give rated engine speed.

TEST G: Maximum drawbar horsepower is determined in each gear when the carburetor is set for fuel economy as in test C. The throttle valve is held wide open and the load is applied so that the engine runs at rated engine speed.
When operating in low gear it is not uncommon for the tractor to develop less drawbar horsepower than in rated gear because of excessive wheel slippage. When excessive wheel slippage occurs the load is reduced until slippage approaches 16%. When the load is reduced it is necessary to operate the tractor engine at part throttle and control engine speed by governor action.

TEST H: Intended to test the ability of the tractor to run continuously for 10 hours at rated drawbar horsepower and to determine the fuel consumption during that time. Rated drawbar horsepower is 75% of 100% maximum drawbar horsepower (Test F), corrected to standard conditions.
When operating at rated load the throttle control lever is set to maintain rated engine speed. This rating is less than maximum drawbar horsepower in order that the operator may have a certain amount of reserve.

TEST J: The tractor is operated in rated gear with all added weight removed. This test shows the effect of the removal of added weight on the performance of the tractor when compared with test G. Removal of wheel weights generally increases wheel slippage and decreases drawbar horsepower.

TEST K: Similar to test J except that the smallest tires and lightest wheels offered by the manufacturer are used.