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Test 597: John Deere 520/530 Gasoline

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NEBRASKA TRACTOR TEST NO. 597

JOHN DEERE 520 GASOLINE

FUEL, OIL, WATER and TIME Fuel Gasoline Octane No. ASTM 82 Research 87.2 (rating taken from oil company's typical inspection data) Weight per gallon 6.152 lb Oil SAE 10W-30 70.7% Oil motor 1,520 gal Drained from motor 0.898 gal Water used none Total time motor was operated 38 3/4 hours.

CHASSIS TYPE Trike Serial No. 5200003 Tread width rear 56” to 88” front 7 5/16” and 11 3/16” Wheel base 50” Hydraulic control system direct engine drive with throw out lever Advertised speeds mph first 1” second 2” third 3” fourth 4” fifth 5” sixth 10 reverse 2” Belt pulley diam 9 11/16” face 7 1/4” rpm 1325 Belt speed 3360 rpm Belt flat Length 72” Width 7” Thickness 0.216” Maximum slip 0.8% Clutch double disc dry type operated by hand lever Seat upholstered seat cushioned by rubber in torsion Brakes internal expanding shoes operated by two foot pedals Equalized no Power take-off direct engine drive with independent clutch Steerer aided by hydraulic power steering.

ENGINE Make John Deere Type 2 cylinder horizontal Serial No. 5200003 Crankshaft mounted crosswise Head L Lubrication pressure Bore and stroke 4 11/16” x 5 3/8” Rated rpm 1325 Compression ratio 7.1:1 to 1 Displacement 189.8 cu. in. Port diameter valves inlet 1 5/8” exhaust 1 5/8” Governor variable speed centrifugal Carburetor size 1 5/8” Ignition system battery Starting system 12 volts (2-6 volt batteries) Air cleaner oil washed wire mesh Muffler was used Oil filter replaceable impregnated paper element Cooling medium temperature control thermostat.

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 carburetor set for 100% maximum belt 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, H, J, K, and L were made with an operating setting of the carburetor (selected by the manufacturer) of 96 1/2% of maximum belt horsepower.

HORSEPOWER SUMMARY

Drawbar Belt

1. Sea level (calculated) maximum horsepower (based on 60° F and 29.92 Hg) 34.31 38.58
2. Observed maximum horsepower (tests F and B) 38.27 37.52
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (ASAE and SAE ratings) 25.73 29.79
4. We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 597.

L. F. LARSEN
Engineer-in-Charge

L. W. HURLBUT
G. W. STEINBRUEGGE
J. J. SULIK
Board of Tractor Test Engineers

Department of Agricultural Engineering
Date of test: October 6, 1956 to October 10, 1956
Manufacturer: JOHN DEERE WATERLOO TRACTOR WORKS OF DEERE MANUFACTURING CO., WATERLOO, IOWA
Manufacturer's rating: Not rated
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 accesories 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 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. The throttle valve is 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, ¹/₂ rated load, maximum load at wide open throttle valve, ¹/₄ and ³/₄ 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.

TEST F: This torque test is run with wide open throttle. Loads are applied to reduce engine speed in approximately ten 5% increments. Rated speed equals 100%. The corresponding dynamometer torque is recorded as a per cent of torque at rated speed.

DRAWBAR HORSEPOWER TESTS

In all drawbar tests the pull exerted by the tractor is transmitted by a hydraulic pressure cylinder to a recording instru-