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January 1960

Test 766: Oliver 1800

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 766 - OLIVER 1800 GASOLINE

The University of Nebraska Agricultural Experiment Station

E. F. Frolik, Dean and Acting Director, Lincoln, Nebraska

POWER TAKE-OFF PERFORMANCE

| Hp | Crank shaft speed rpm | Fuel Consumption Gal per hr | Lb per hp-hr | Hp-hr per gal | Temp Cool- ing med | Degrees F Air wet bulb | Air dry bulb | Barometer inches of mercury |
|--|--------------------------------|--------------------------------------|--------------------|---------------------|-----------------------------|---------------------------------|--------------------|-----------------------------------|
| MAXIMUM POWER AND FUEL CONSUMPTION | | | | | | | | |
| Rated Engine Speed—Two Hours | | | | | | | | |
| 73.92 | 2000 | 5.608 | 0.472 | 13.18 | 133 | 60 | 75 | 29.048 |
| VARYING POWER AND FUEL CONSUMPTION—TWO HOURS | | | | | | | | |
| 64.34 | 2048 | 4.975 | 0.481 | 12.93 | 130 | 60 | 75 | ..... |
| 0.00 | 2181 | 1.649 | ..... | ..... | 120 | 58 | 72 | ..... |
| 32.69 | 2082 | 3.418 | 0.651 | 9.56 | 122 | 58 | 74 | ..... |
| 73.78 | 2000 | 5.616 | 0.474 | 13.14 | 130 | 60 | 75 | ..... |
| 16.59 | 2114 | 2.589 | 0.971 | 6.41 | 125 | 59 | 74 | ..... |
| 48.71 | 2067 | 4.127 | 0.527 | 11.80 | 128 | 60 | 75 | ..... |
| Av 39.35 | 2082 | 3.729 | 0.590 | 10.55 | 126 | 59 | 74 | 29.028 |

DRAWBAR PERFORMANCE

| Hp | Draw- bar pull lbs | Speed miles per hr | Crank shaft speed rpm | Slip of drivers % | Fuel Consumption Gal per hr | Lb per hp hr | Hp-hr per gal | Temperature Cooling medium | Degrees F Air wet bulb | Air dry bulb | Barometer inches of mercury |
|---|-----------------------------|-----------------------------|--------------------------------|----------------------------|--------------------------------------|-----------------|------------------|----------------------------------|---------------------------------|--------------------|-----------------------------------|
| VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST | | | | | | | | | | | |
| Maximum Available Power—Two Hours—4th Gear | | | | | | | | | | | |
| 61.66 | 4427 | 5.22 | 2000 | 4.33 | 5.267 | 0.532 | 11.71 | 132 | 58 | 68 | 28.730 |
| 75% of Pull at Maximum Power—Ten Hours—4th Gear | | | | | | | | | | | |
| 50.32 | 3485 | 5.41 | 2060 | 3.51 | 4.580 | 0.566 | 10.99 | 129 | 54 | 63 | 28.789 |
| 50% of Pull at Maximum Power—Two Hours—4th Gear | | | | | | | | | | | |
| 33.68 | 2275 | 5.55 | 2080 | 2.15 | 3.725 | 0.688 | 9.04 | 130 | 58 | 65 | 28.770 |
| MAXIMUM POWER WITH BALLAST | | | | | | | | | | | |
| 40.77 | 10619 | 1.44 | 2067 | 14.99 | 1st Gear..... | ..... | ..... | 131 | 58 | 70 | 28.920 |
| 61.55 | 8115 | 2.84 | 1999 | 9.78 | 2nd Gear..... | ..... | ..... | 134 | 58 | 70 | 28.920 |
| 62.58 | 5703 | 4.11 | 2000 | 6.73 | 3rd Gear..... | ..... | ..... | 138 | 58 | 70 | 28.920 |
| 63.71 | 4626 | 5.16 | 1998 | 5.12 | 4th Gear..... | ..... | ..... | 136 | 58 | 70 | 28.920 |
| 63.03 | 2860 | 8.26 | 2006 | 2.93 | 5th Gear..... | ..... | ..... | 135 | 57 | 67 | 28.900 |
| 55.98 | 1452 | 14.46 | 2005 | 1.71 | 6th Gear..... | ..... | ..... | 133 | 57 | 67 | 28.900 |
| MAXIMUM POWER WITHOUT BALLAST | | | | | | | | | | | |
| 63.12 | 4605 | 5.14 | 2004 | 7.06 | 4th Gear..... | ..... | ..... | 134 | 69 | 77 | 28.930 |
| VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—4th Gear | | | | | | | | | | | |
| Pounds pull | 4650 | 4700 | 4800 | 4850 | 4900 | 4950 | 4750 | | | | |
| Horsepower | 63.7 | 58.9 | 52.5 | 46.6 | 40.5 | 34.3 | 26.6 | | | | |
| Miles per hour | 5.2 | 4.7 | 4.1 | 3.6 | 3.1 | 2.6 | 2.1 | | | | |

TIRES, BALLAST and WEIGHT

| | | With Ballast | Without Ballast |
|----------------------------|----------------------|------------------|------------------|
| Rear tires | —No, size, ply & psi | Two 18.4-34;8;20 | Two 18.4-34;8;16 |
| Ballast | —Liquid | 745 lb each | None |
| | —Cast iron | 1950 lb each | None |
| Front tires | —No, size, ply & psi | Two 7.50-15;6;36 | Two 7.50-15;6;28 |
| Ballast | —Liquid | None | None |
| | —Cast iron | 268 lb each | None |
| Height of drawbar | | 21 inches | 22 inches |
| Static weight | —Rear | 11280 lb | 5890 lb |
| | —Front | 2880 lb | 2345 lb |
| Total weight with operator | | 14335 lb | 8410 lb |

Department of Agricultural Engineering

Dates of Test: October 3 to October 11, 1960

Manufacturer: THE OLIVER CORPORATION,

CHARLES CITY, IOWA

Manufacturer's Power Rating: Not Rated

FUEL, OIL and TIME Fuel regular gasoline Oc-tane No motor 84 Research 92 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.7475 Weight per gallon 6.223 lb Oil SAE 10W API service classification MS, DG To motor 1.644 gal Drained from motor 1.248 gal Transmission and final-drive lubricant SAE 10W-30 engine oil with Oliver special oil additive Total time engine was operated 45 hours.

ENGINE Make Oliver Gasoling Type 6 cylinder vertical Serial No 115662 Crankshaft mounted length-wise Rated rpm 2000 Bore and stroke 3 3/4" x 4" Compression ratio 8.5 to 1 Displacement 265 cu in Carburetor size 1 1/4" Ignition system battery Crank-ing system 12 volt electric Lubrication pressure Air cleaner oil washed wire mesh Oil filter replaceable pleated paper element Fuel filter screen in sediment bowl Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type tricycle Serial No 90526-886 Tread width rear 68" to 89 1/2" front 9 1/4" to 14 1/2" Wheel base 103" Center of gravity (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for oeration) Horizontal distance forward from center-line of rear wheels 30.9" Vertical distance above roadway 35.5" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system direct engine drive Trans-mission selective gear fixed ratio Advertised speeds mph first 1.59 second 3.07 third 4.29 fourth 5.31 fifth 8.27 sixth 14.30 reverse 1.80 and 4.84 Clutch single plate operated by foot pedal Brakes double disc operated by foot pedals which can be locked Steering power assisted Turning radius (on concrete surface with brake applied) right 115" left 115" (on concrete surface without brake) right 124" left 124" Turning space diameter (on concrete surface with brake applied) right 237" left 237" (on concrete surface without brake) right 256" left 256" Belt pulley 1053 rpm at 2000 engine rpm diam 11 5/16" face 8 3/4" Belt speed 3100 fpm Power take-off 1000 rpm at 2000 engine rpm.

REPAIRS and ADJUSTMENTS No repairs or ad-justments.

REMARKS All test results were determined from observed data obtained in accordance with the SAE and ASAE test code.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 766.

L. F. LARSEN

Engineer-in-Charge

L. W. HURLBUT, Chairman

G. W. STEINBRUEGGE

J. J. SULEK

Board of Tractor

Test Engineers

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories can be disconnected only when it is convenient for the operator to do so in practice. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of Automotive Engineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. The tire tread-bar height must be at least 65% of new tread height prior to the maximum power run.

BELT OR POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representative makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the belt pulley or the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, $\frac{1}{2}$ the 85% torque; maximum power; $\frac{1}{4}$ and $\frac{3}{4}$ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general usage.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests. If the manufacturer specifies a different rated crankshaft speed for drawbar operations, then the position of the manually operated governor control is changed to provide the high-idle speed specified by the manufacturer in the operating instructions.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effect of speed-control devices (engine governor, automatic transmissions, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree

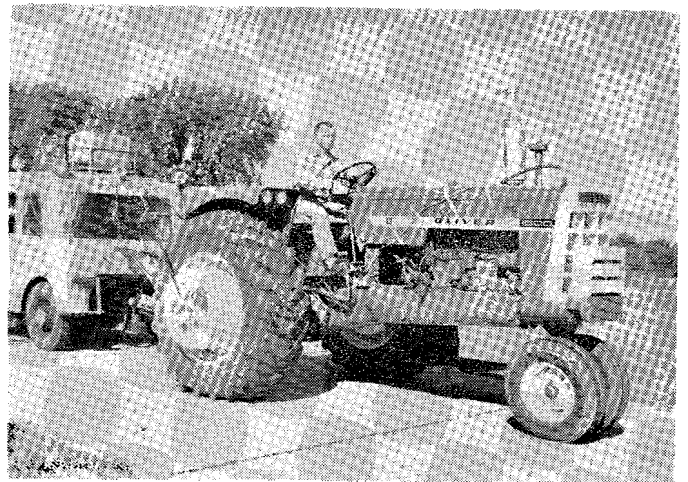
turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; and (3) 50% of the pull at maximum power. Prior to 1958, fuel consumption data (10 hour test) were shown only for the pull obtained at maximum power for tractors having torque converters and at 75% of the pull obtained at maximum power for gear-type tractors.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 12 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe-limit for the test course. The maximum safe speed for the Nebraska Test Course has been set at 15 miles per hour. The slippage limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Maximum Power Without Ballast. All added ballast is removed from the tractor. The maximum drawbar power of the tractor is determined by the same procedure used for getting maximum power with ballast. The gear (or travel speed) is the same as that used in the 10-hour test.

Varying Power and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions; (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

For additional information about the Nebraska Tractor Tests write to the Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska.



Oliver 1800 Gasoline