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Test 1042: Oliver 1655

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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NEBRASKA TRACTOR TEST 1042—OLIVER 1655 GASOLINE (ALSO MINNEAPOLIS-MOLINE G750 GASOLINE)

POWER TAKE-OFF PERFORMANCE

Hp	Crank- shaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
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MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—Two Hours (PTO Speed—994 rpm)								
70.27	2200	6.624	0.575	10.61	194	58	75	29.073

VARYING POWER AND FUEL CONSUMPTION—TWO HOURS

61.63	2270	6.121	0.606	10.07	191	57	76	.....
0.00	2451	2.650	.....	.....	180	56	75	.....
31.80	2342	4.218	0.809	7.54	186	56	75	.....
70.05	2202	6.618	0.576	10.58	194	57	76	.....
16.33	2405	3.520	1.315	4.64	184	56	75	.....
46.58	2289	5.113	0.670	9.11	189	57	76	.....
Av 37.73	2326	4.707	0.761	8.02	189	57	75	29.027

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	Temp Degrees F Cool- ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
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VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST

Maximum Available Power—Two Hours—7th Gear (3rd Direct)											
57.44	5147	4.19	2202	7.44	6.498	0.690	8.84	185	58	66	28.930
75% of Pull at Maximum Power—Ten Hours—7th Gear (3rd Direct)											
46.08	3930	4.40	2263	5.35	5.678	0.752	8.12	185	66	85	28.918
50% of Pull at Maximum Power—Two Hours—7th Gear (3rd Direct)											
32.28	2631	4.60	2319	3.39	4.630	0.875	6.97	179	64	70	28.860

MAXIMUM POWER WITH BALLAST

51.73	8519	2.28	2218	14.92	2nd Gear (1st Direct)			181	66	78	28.860
56.06	6185	3.40	2197	9.21	5th Gear (3rd Under)			182	58	78	28.960
56.91	5887	3.63	2200	8.88	6th Gear (2nd Direct)			185	57	77	28.960
58.27	5227	4.18	2203	7.68	7th Gear (3rd Direct)			184	58	77	28.960
56.52	4152	5.10	2200	5.67	9th Gear (3rd Over)			188	58	78	28.950
57.02	4030	5.31	2200	5.53	10th Gear (4th Under)			185	58	77	28.950
58.48	3393	6.46	2206	4.74	11th Gear (4th Direct)			187	59	80	28.940
58.21	2699	8.09	2201	3.65	14th Gear (5th Direct)			185	59	80	28.940

MAXIMUM PULL WITHOUT BALLAST

46.91	6136	2.87	2225	14.93	4th Gear (2nd Under)			188	72	92	28.850
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VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—7th Gear (3rd Direct)

Pounds Pull	5227	5575	5782	5935	6009	6081	5873
Horsepower	58.27	55.18	50.93	45.63	39.35	32.78	25.31
Crankshaft Speed rpm	2203	1967	1760	1541	1316	1086	865
Miles per Hour	4.18	3.71	3.30	2.88	2.46	2.02	1.62
Slip of Drivers %	7.68	8.02	8.55	8.95	9.21	9.34	9.08

TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 18.4-34; 6; 16	Two 18.4-34; 6; 16
Ballast	—Liquid	831 lb each	None
	Cast iron	684 lb each	None
Front tires	—No, size, ply & psi	Two 7.50-16; 6; 40	Two 7.50-16; 6; 40
Ballast	—Liquid	None	None
	Cast iron	20 lb each	None
Height of drawbar		21 inches	22 inches
Static weight with operator—Rear		8730 lb	5700 lb
	Front	2120 lb	2080 lb
	Total	10850 lb	7780 lb

Department of Agricultural Engineering

Dates of Test: May 7 to May 22, 1970

Manufacturer: WHITE FARM EQUIPMENT,
HOPKINS, MINNESOTA

FUEL, OIL and TIME Fuel regular gasoline Octane No Motor 84.6 Research 92.4 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.7330 Weight per gallon 6.102 lb Oil SAE 20-20W API service classification MS, DM To motor 1.917 gal Drained from motor 1.764 gal Transmission and final-drive lubricant SAE 80 Total time engine was operated 47½ hours.

ENGINE Make Oliver gasoline Type 6 cylinder vertical Serial No 179963 Crankshaft mounted lengthwise Rated rpm 2200 Bore and stroke 3¼" x 4" Compression ratio 8 to 1 Displacement 265 cu in Carburetor size 1¼" Ignition system battery Cranking system 12 volt electric Lubrication pressure Air cleaner dry type with automatic dust unloader Oil filter full flow replaceable pleated paper cartridge Fuel filter sediment bowl with screen Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No 220-218-490 Tread width rear 56½" to 89½" front 60" to 84" Wheel base 105½" Center of gravity (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 28.2" Vertical distance above roadway 32.4" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system engine driven Transmission selective gear fixed ratio with partial (3) range operator controlled power shifting Advertised speeds mph first 2.19 second 2.64 third 3.16 fourth 3.28 fifth 3.72 sixth 3.96 seventh 4.49 eighth 4.74 ninth 5.38 tenth 5.58 eleventh 6.73 twelfth 6.93 thirteenth 8.06 fourteenth 8.35 fifteenth 10.01 sixteenth 11.78 seventeenth 14.20 eighteenth 17.02 reverse 2.54, 3.06, 3.66, 4.31, 5.20 and 6.23 Clutch Single plate dry disc operated by foot pedal Brakes twin disc operated by two foot pedals that can be locked together Steering hydrostatic power Turning radius (on concrete surface with brake applied) right 146" left 146" (on concrete surface without brake) right 166" left 166" Turning space diameter (on concrete surface without brake) right 340" left 340" Belt pulley 1035 rpm at 2200 engine rpm diam 11½" face 8" Belt speed 3106 fpm Power take-off 994 rpm at 2200 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with the SAE and ASAE test code. First gear was not run as it was necessary to limit the pull in second gear because of excessive slippage. The third, fourth, eighth, twelfth, thirteenth, fifteenth, sixteenth, seventeenth and eighteenth gears were not run as test procedure requires only eight gears.

We, the undersigned certify that this is a true and correct report of official Tractor Test 1042.

L. F. LARSEN

Engineer-In-Charge

G. W. STEINBRUEGGE

W. E. SPLINTER

D. E. LANE

Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
E. F. Frolik, Dean; H. W. Ottoson, Director; Lincoln, Nebraska

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. Prior to the maximum power run the tire tread-bar height must be at least 65% of new tread height.

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, $\frac{1}{2}$ of 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.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effect of speed-control devices (engine, governor, automatic trans-

mission, 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.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 8 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 manufacturer's representative has the option of selecting one gear or speed over eight miles per hour. 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 Pull without Ballast. All added ballast is removed from the tractor. The drawbar pull is determined at slip limits of 15% for pneumatic tires or 7% for steel tracks or lugs. The tractor is operated at the fastest possible travel speed.

Varying Drawbar Pull 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 68503.



OLIVER 1655 GASOLINE