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Test 517: Oliver OC-6 Diesel

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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The Experiment Station
University of Nebraska College of Agriculture
W. V. Lambert, Director, Lincoln, Nebraska

Department of Agricultural Engineering
Dates of test: April 17 to May 7, 1954
Manufacturer: THE OLIVER CORPORATION,
CLEVELAND, OHIO
Manufacturer's rating: Not rated

NEBRASKA TRACTOR TEST NO. 517

OLIVER OC-6 DIESEL

DRAWBAR HORSEPOWER TESTS

Hp	Draw bar pull lb	Speed miles per hr	Crank shaft speed rpm	Slip of drive wheels %	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercury
					Gal per hour	Hp-hr per gal	Lb per hp-hr		Cool- ing med	Air	
TESTS F AND G—100% MAXIMUM LOAD											
33.01	6779	1.83	1599	3.41	.....	Not Recorded	.....	174	66	28.830
33.46	5204	2.41	1601	1.67	.....	Not Recorded	.....	174	63	28.900
31.80	3708	3.22	1597	0.93	.....	Not Recorded	.....	178	67	28.875
30.48	2729	4.19	1604	0.80	.....	Not Recorded	.....	175	67	28.800
28.90	2104	5.15	1601	0.58	.....	Not Recorded	.....	177	66	28.800
21.98	922	8.94	1609	0.17	.....	Not Recorded	.....	178	66	28.800
TEST H—RATED LOAD—TEN HOURS—2nd Gear											
26.21	4066	2.42	1602	1.42	2.159	12.14	0.575	0.00	175	61	28.710
TEST J—OPERATING MAXIMUM LOAD—2nd Gear											
33.19	5193	2.40	1601	2.34	.....	Not Recorded	.....	176	64	28.700

FUEL, OIL and TIME Diesel Fuel Cetane No. 50 (rating taken from oil company's typical inspection data): weight per gallon 6.979 lb **OIL** SAE 10; to motor 1.966 gal; drained from motor 1.037 gal. Total time motor was operated 37½ hours.

CHASSIS Type Tracklayer Serial No. 4501134 Tread Width 68" Wheel Base 54 3/16" Measured length of track 196" Cleats Integral with shoes Cleats per track 33 Size of cleats 12" x 1¼" Hydraulic control system direct engine drive Advertised speeds mph first 1.88 second 2.44 third 3.23 fourth 4.19 fifth 5.15 sixth 8.86 reverse 1.92 and 3.31 Belt pulley not available Clutch single plate dry disc operated by foot pedal Seat pressed steel and cushioned by rubber in torsion Brakes contracting bands operated by steering levers that can be locked by latches. Power take-off direct engine drive with independent hand clutch.

ENGINE Make Oliver Diesel Type 6 cylinder vertical Serial No. D1-922054 Crankshaft mounted lengthwise Head I Lubrication pressure Bore and Stroke 3 5/16" x 3 3/4" Rated rpm 1600 Compression ratio 15.75 to 1 Displacement 193.9 cu. in. Port Diameter Valves Inlet 1 5/64" Exhaust 1 5/16" Governor variable speed centrifugal Starting System 12 volt electric Air Cleaner oil washed wire mesh Muffler was used Oil Filter two replaceable waste packed elements Fuel Filters one brass screen, one replaceable waste type element and one replaceable paper cartridge element Cooling medium temperature control thermostat.

TOTAL WEIGHT AS TESTED (with operator) (F, G & H) 7560 pounds.

TOTAL WEIGHT AS TESTED (with operator) (J) 6742 pounds.

REPAIRS AND ADJUSTMENTS The 14" tracks were replaced with 12" tracks before starting test F because of soil conditions.

REMARKS All test results were determined from observed data and without allowances, additions or deductions. Test F was made with fuel pump set to develop approximately 34.5 maximum drawbar horsepower and data from this test were used in determining the horsepower to be developed in Test H. Tests F, G, H & J were made with the same setting.



HORSEPOWER SUMMARY

	Drawbar
1. Sea level (calculated) maximum horsepower (based on 60° F and 29.92" HG)	34.74
2. Observed maximum horsepower (Test F)	33.46
3. Seventy-five per cent of the calculated maximum drawbar horsepower (formerly ASAE and SAE ratings)	26.06

We, the undersigned, certify that this is a true and correct report of official tractor test No. 517.

L. F. LARSEN
Engineer-in-charge

C. W. SMITH
L. W. HURLBUT
F. D. YUNG
Board of Tractor
Test Engineers

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, $\frac{1}{2}$ rated load, maximum load at wide open throttle valve, $\frac{1}{4}$ and $\frac{3}{4}$ 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.

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.