

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1964

Test 865: Case 750 (Diesel)

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Nebraska Tractor Test Lab, "Test 865: Case 750 (Diesel)" (1964). *Nebraska Tractor Tests*. 1255.
<https://digitalcommons.unl.edu/tractormuseumlit/1255>

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.

NEBRASKA TRACTOR TEST 865 - CASE 750 DIESEL

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

DRAWBAR PERFORMANCE

Hp	Draw- bar pull lbs	Speed miles per hr	Crank- shaft speed rpm	Slip of drivers %	Fuel Consumption			Temp Degrees F				Barom- eter inches of Mercury
					Gal per hr	Lb per hp-hr	Hp-hr per gal	Cool- ing med	Air wet bulb	Air dry bulb		

VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST

Maximum Available Power—Two Hours—Second Gear												
36.25	7155	1.90	1843	2.80	4.377	0.835	8.28	174	60	73	28.970	

75% of Pull at Maximum Power—Ten Hours—Second Gear												
34.45	5479	2.36	1880	2.31	4.502	0.903	7.65	177	66	75	28.700	

50% of Pull at Maximum Power—Two Hours—Second Gear												
26.81	3572	2.81	1963	0.81	4.259	1.098	6.29	174	69	73	28.510	

MAXIMUM POWER WITH BALLAST

37.15	10327	1.35	1829	3.71	1st Gear	183	75	83	28.440			
38.08	7301	1.96	1861	2.74	2nd Gear	171	55	61	29.050			
37.01	5041	2.75	1849	1.67	3rd Gear	172	59	69	29.040			
35.54	3693	3.61	1832	1.04	4th Gear	177	59	69	29.040			

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST Second Gear

Pounds pull	7301	7524	8173	9007	10332	10987	12543	14639				
Horsepower	38.08	37.46	36.56	34.72	32.59	32.40	28.62	22.54				
Crankshaft Speed rpm	1861	1850	1834	1811	1790	1780	1742	1729				
Miles per hour	1.96	1.87	1.68	1.45	1.18	1.11	0.86	0.58				
Slip of drivers %	2.74	2.55	2.92	3.65	4.73	4.61	4.73	6.59				

Department of Agricultural Engineering

Dates of Test: August 17 to September 8, 1964

Manufacturer: J. I. CASE COMPANY, RACINE, WISCONSIN

FUEL, OIL and TIME: Fuel No. 2 Diesel Cetane No. 57.0 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8304 Weight per gallon 6.914 lb Oil SAE 30 API service classification MS, DS To motor 2.261 gal Drained from motor 1.872 gal Transmission type "C" torque converter oil Final drive lubricant SAE 90 E.P. Total time engine was operated 42½ hours.

ENGINE: Make Case diesel Type four cylinder vertical Serial No. 2038716 Crankshaft mounted lengthwise Rated rpm 1900 Bore and stroke 4" x 4½" Compression ratio 15.2 to 1 Displacement 267 cu in Cranking system 24 volt electric (four 6-volt batteries) Lubrication pressure Air cleaner oil washed wire mesh Oil filter full flow replaceable pleated paper element Oil cooler engine coolant heat exchangers for crankcase oil and torque converter oil Fuel filter first and second stage filters with replaceable wound thread elements and final stage filter with replaceable paper cartridge Muffler was used Cooling medium temperature control thermostat.

CHASSIS: Type tracklayer Serial No. 7070677 Tread width rear 54" Wheel base 73" Drawbar height 14" Measured length of track 18.75 ft Cleats integral with shoes Cleats per track 30 Size of cleats 14" x 2½" 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 33½" Vertical distance above roadway 22½" Horizontal distance from center of rear wheel tread 0" to the right / left Hydraulic control system direct engine drive Transmission selective gear fixed ratio with partial range operator controlled power shifting and torque converter. Advertised speeds mph first 0-2.13 second 0-2.98 third 0-4.08 fourth 0-5.67 reverse first 0-2.34 second 0-3.27 third 0-4.49 fourth 0-6.24 Clutch six multiple disc clutches within transmission operated hydraulically by hand levers or foot pedals Brakes foot pedals operating disc brakes hydraulically and hand lever for parking Steering hand levers controlling power shifting in two speed ranges for each track independently or by brake pedals Turning space diameter (with brake applied) right 177.8" left 172.4" (without brake) right 274" left 273" Belt pulley none Power take-off None Total weight with operator 14035 lbs including front counter weight 1000 lbs, guards for crankcase, torque converter and transmission 118 lbs., rock guards 376 lbs and mounting platform 86 lbs, front pull hook—12 lbs.

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.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 865.

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 trans-

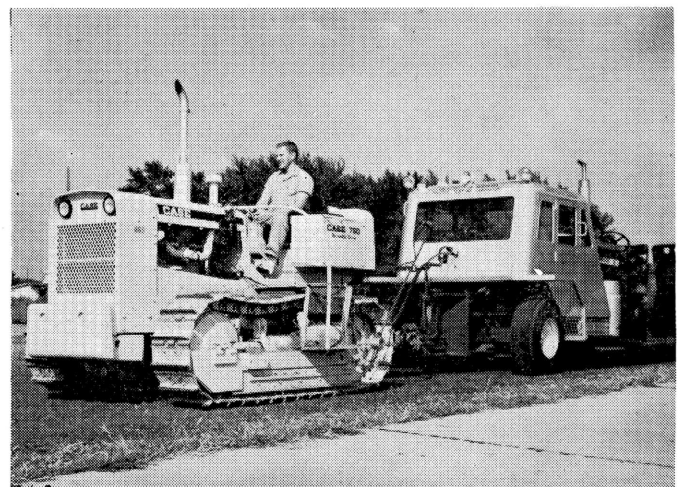
mission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the 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. 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.



Case 750 Diesel