

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1960

Test 807: Massey-Ferguson MF-50 (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 807: Massey-Ferguson MF-50 (Diesel)" (1960). *Nebraska Tractor Tests*. 1213.

<https://digitalcommons.unl.edu/tractormuseumlit/1213>

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 807 - MASSY-FERGUSON MF50 DIESEL

The University of Nebraska Agricultural Experiment Station

E. F. Frolik, Dean; H. H. Kramer, Director, Lincoln, Nebraska

POWER TAKE-OFF PERFORMANCE

Hp	Crank shaft speed rpm	Fuel Consumption		Hp-hr per gal	Temp. Degrees F			Barometer inches of mercury	
		Gal per hr	Lb per hp-hr		Cooling med	Air wet bulb	Air dry bulb		
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours									
38.33	2000	2.438	0.439	15.72	195	56	75	29.265	
Standard Power Take-off Speed (540 rpm)—One Hour									
31.08	1499	1.923	0.427	16.16	197	56	75	29.255	
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS									
33.11	2032	2.075	0.432	15.96	182	56	76	.....
0.00	2063	0.635	.....	.....	140	55	75	.....
16.66	2045	1.292	0.535	12.89	163	55	75	.....
38.29	2001	2.441	0.440	15.69	201	56	77	..	
8.35	2052	0.918	0.758	9.10	152	55	75	.....
24.82	2030	1.662	0.462	14.93	170	56	76	.....
Av	20.21	2037	1.504	0.513	13.44	168	55	75	29.257

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank shaft speed rpm	Slip of drivers %	Fuel Consumption		Hp-hr per gal	Temperature Degrees F			Barometer inches of mercury
					Gal per hr	Lb per hp-hr		Cooling medium	Air wet bulb	Air dry bulb	
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
32.42	2436	4.99	1995	6.20	2.416	0.514	13.42	184	58	62	28.438
26.62	1929	5.18	2038	4.82	1.982	0.514	13.43	181	49	54	28.881
18.02	1288	5.25	2037	3.47	1.523	0.583	11.83	162	57	60	28.498
MAXIMUM POWER WITH BALLAST											
19.45	4196	1.74	2037	14.69	2nd Gear	.....	.....	180	48	63	29.150
31.97	3643	3.29	2009	10.69	3rd Gear	.....	.....	180	47	62	29.150
34.20	2570	4.99	2004	6.67	4th Gear	.....	.....	180	45	57	29.220
33.21	1620	7.69	2004	3.97	5th Gear	.....	.....	180	46	60	29.220
30.65	797	14.42	1995	1.46	6th Gear	.....	.....	180	47	61	29.200
MAXIMUM POWER WITHOUT BALLAST											
33.86	2614	4.86	2003	9.55	4th Gear	.....	.....	184	32	38	28.880
VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—4th Gear											
Pounds pull	2550	2650	2750	2800	2750	2800	2750	2750	2650		
Horsepower	34.2	31.8	29.3	25.7	22.4	18.3	14.1				
Miles per hour	5.0	4.5	4.0	3.5	3.0	2.5	2.0				

TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 12.4-28;4;14	Two 12.4-28;4;12
	—Liquid	358 lb each	None
	—Cast iron	600 lb each	None
Front tires	—No, size, ply & psi	Two 6.00-16;4;24	Two 6.00-16;4;20
	—Liquid	50 lb each	None
	—Cast iron	33 lb each	None
Height of drawbar		22 1/2 inches	23 inches
Static weight	—Rear	4110 lb	2195 lb
	—Front	1732 lb	1563 lb
Total weight with operator		6017 lb	3933 lb

Department of Agricultural Engineering
 Dates of Test: October 23 to November 3, 1961
 Manufacturer: MASSEY-FERGUSON INC., DE-TROIT, MICHIGAN
 Manufacturer's Power Rating: Not Rated

FUEL, OIL and TIME Fuel No 2 Diesel Cetane No 54 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8283 Weight per gallon 6.896 lb Oil SAE 20-20W API service classification MS, DG To motor 1.454 gal Drained from motor 0.956 gal Transmission and final-drive lubricant SAE 80 (E.P.) Total time engine was operated 44 hours.

ENGINE Make Perkins Diesel Type 3 cylinder vertical Serial No CL 1877277 Crankshaft mounted lengthwise Rated rpm 2000 Bore and stroke 3.6" x 5" Compression ratio 17.4 to 1 Displacement 152.7 cu in Cranking system 12 volt electric Lubrication pressure Air cleaner oil washed crimped wire Oil filter replaceable paper element Fuel filter one replaceable treated paper element and one replaceable special CAV paper element Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No SNM 529252 Tread width rear 48" to 76" front 48" to 80" Wheel base 81.26" 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 34 1/16" Vertical distance above roadway 27" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system constant running transmission driven Transmission selective gear fixed ratio Advertised speeds mph first 1.33 second 1.99 third 3.64 fourth 5.32 fifth 7.96 sixth 14.57 reverse 1.77 and 7.09 Clutch dual dry disc clutches operated by single foot pedal Brakes expanding double shoe operated by two independent foot pedals which can be locked together Steering power assisted Turning radius (on concrete surface with brake applied) right 120" left 122" (on concrete surface without brake) right 133" left 139" Turning space diameter (on concrete surface with brake applied) right 251" left 254" (on concrete surface without brake) right 276" left 288" Belt pulley 1356 rpm at 2000 engine rpm 9" face 6 1/2" Belt speed 3200 fpm Power take-off 540 rpm at 1500 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 to avoid excessive wheel slippage.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 807.

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

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.**



Massey-Ferguson MF50 Diesel