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Test 808: Massey-Ferguson MF-65 Dieselmatic

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 808 - MASSY-FERGUSON MF65 DIESELMATIC

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		Cool- ing med	Air wet bulb	Air dry bulb		
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours									
50.98	2000	3.130	0.423	16.29	188	56	75	29.197	
Standard Power Take-off Speed (540 rpm)—One Hour									
42.67	1500	2.491	0.403	17.13	184	55	75	29.140	
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS									
44.28	2042	2.715	0.423	16.31	185	56	76	.....
0.00	2158	0.922	.....	.....	174	55	75	.....
22.87	2112	1.766	0.533	12.95	179	55	76	.....
51.01	2000	3.167	0.428	16.11	190	56	77	.....
11.57	2136	1.340	0.799	8.63	174	55	75	.....
33.76	2076	2.188	0.447	15.43	183	55	76	.....
Av	27.25	2087	2.016	0.510	13.52	181	55	76	29.075

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank shaft speed rpm	Slip of drivers %	Fuel Consumption			Temperature Degrees F			Barometer inches of mercury		
					Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling medium	Air wet bulb	Air dry bulb			
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST													
Maximum Available Power—Two Hours—7th Gear													
43.95	3218	5.12	2004	4.98	3.181	0.499	13.82	187	55	63	28.555		
75% of Pull at Maximum Power—Ten Hours—7th Gear													
35.66	2513	5.32	2058	3.84	2.565	0.496	13.90	184	45	47	29.077		
50% of Pull at Maximum Power—Two Hours—7th Gear													
24.82	1694	5.50	2098	2.69	2.013	0.559	12.33	170	61	67	28.403		
MAXIMUM POWER WITH BALLAST													
33.40	7029	1.78	2065	14.59	3rd Gear	.....	180	55	64	28.600		
41.40	6834	2.27	2000	14.05	4th Gear	.....	183	55	64	28.600		
44.41	4895	3.40	2000	7.98	5th Gear	.....	185	55	64	28.600		
43.92	3614	4.56	1997	5.72	6th Gear	.....	184	55	64	28.600		
45.62	3353	5.10	2002	5.30	7th Gear	.....	186	55	63	28.580		
44.55	2474	6.75	1998	3.97	8th Gear	.....	185	55	63	28.550		
44.95	2167	7.78	1997	3.60	9th Gear	.....	179	55	63	28.550		
42.45	1541	10.33	2004	2.41	10th Gear	.....	182	55	63	28.550		
40.11	1031	14.59	2008	1.90	11th Gear	.....	180	55	63	28.550		
MAXIMUM POWER WITHOUT BALLAST													
42.29	3326	4.77	2004	12.24	7th Gear	.....	186	61	68	28.320		
VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—7th Gear													
Pounds pull	3350		3550		3650		3750		3800		3750	3600	
Horsepower		45.6		43.5		38.9		35.0		30.4		25.0	19.2
Miles per hour		5.1		4.6		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 13-28;6;18	Two 13-28;6;14
Ballast	—Liquid	608 lb each	None
	—Cast iron	1373 lb each	None
Front tires	—No, size, ply & psi	Two 6.00-16;6;48	Two 6.00-16;6;24
Ballast	—Liquid	70 lb each	None
	—Cast iron	341 lb each	None
Height of drawbar		22 inches	23 inches
Static weight	—Rear	6630 lb	2668 lb
	—Front	2490 lb	1668 lb
Total weight with operator		9295 lb	4511 lb

Department of Agricultural Engineering

Dates of Test: October 24 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 1.953 gal Drained from motor 1.541 gal Transmission and final-drive lubricant SAE 80 (E.P.) Total time engine was operated 43½ hours.

ENGINE Make Perkins Diesel Type 4 cylinder vertical Serial No CL 2913170 Crankshaft mounted lengthwise Rated rpm 2000 Bore and stroke 3.6" x 5" Compression ratio 17.5 to 1 Displacement 203.5 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 SNDW 682157 Tread width rear 52" to 88" front 48" to 80" Wheel base 83.99" 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 33.75" Vertical distance above roadway 30.25" 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 with partial range operator controlled power shifting Advertised speeds mph first 1.28 second 1.68 third 1.93 fourth 2.53 fifth 3.54 sixth 4.64 seventh 5.15 eighth 6.74 ninth 7.72 tenth 10.11 eleventh 14.17 twelfth 18.54 reverse 1.75, 2.29, 7.01, and 9.18 Clutch dual dry disc clutches operated by single foot pedal Brakes double disc operated by two independent foot pedals which can be locked together Steering power assisted Turning radius (on concrete surface with brake applied) right 126" left 126" (on concrete surface without brake) right 140" left 144" Turning space diameter (on concrete surface with brake applied) right 264" left 264" (on concrete surface without brake) right 290" left 300" Belt pulley 1337 rpm at 2000 engine rpm diam 9" face 6½" Belt speed 3150 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 and second gears were not run as it was necessary to limit the pull in third gear to avoid excessive wheel slippage. Twelfth gear was not run as it exceeded 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 808.

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

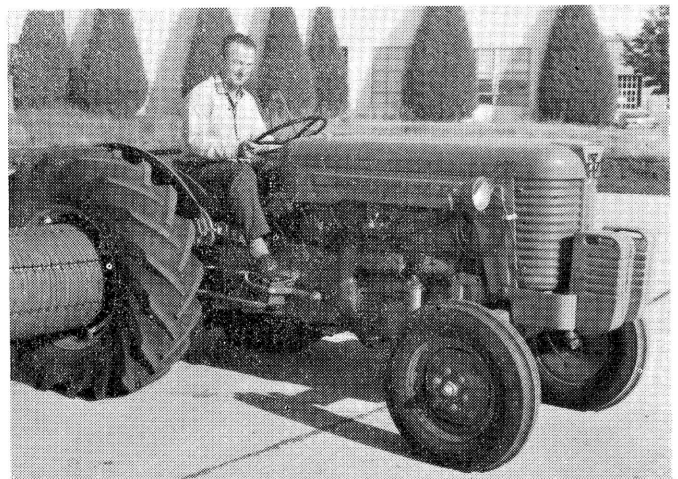
turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum 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 MF65 Dieselmatic