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4-28-1969

## Test 1009: Massey-Ferguson MF 135 Gasoline (Also MF 135 6 or 8-Speed)

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1009 – MASSEY-FERGUSON MF 135 GASOLINE (ALSO MF 135 GASOLINE-STANDARD 6 SPEED OR 8 SPEED)

## POWER TAKE-OFF PERFORMANCE

Hp	Crank- shaft speed rpm	Fuel Consumption		Temperature Degrees F				
		Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours								
37.55 *	2000	3.489	0.564	10.76	193	69	80	28.810
Standard Power Take-off Speed (540 rpm)—One Hour								
35.34	1683	3.152	0.542	11.21	198	70	83	28.810
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS								
34.02	2133	3.123	0.557	10.89	196	71	85	.....
0.00	2265	1.210	.....	.....	185	71	85	.....
17.21	2158	2.041	0.720	8.43	190	71	85	.....
37.36	2000	3.513	0.571	10.63	198	70	84	.....
8.86	2223	1.660	1.138	5.34	185	71	85	.....
27.17	2140	2.579	0.576	10.54	193	70	84	.....
Av	20.77	2153	2.354	0.688	8.82	191	85	28.800

## 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—7th Gear												
32.00	2279	5.26	1999	6.30	3.435	0.652	9.32	190	66	74	28.750	
75% of Pull at Maximum Power—Ten Hours—7th Gear												
26.64	1760	5.68	2119	4.64	2.816	0.642	9.46	190	66	74	28.817	
50% of Pull at Maximum Power—Two Hours—7th Gear												
18.88	1221	5.80	2142	3.54	2.353	0.757	8.02	188	64	69	28.740	
MAXIMUM POWER WITH BALLAST												
27.98	4207	2.49	2096	13.50	4th	Gear .....		190	62	73	28.830	
31.61	3417	3.47	1998	10.03	5th	Gear .....		193	63	75	28.830	
31.46	2522	4.68	2002	7.36	6th	Gear .....		190	64	75	28.830	
32.46	2317	5.25	2003	6.60	7th	Gear .....		193	65	78	28.820	
31.83	1709	6.98	2001	4.81	8th	Gear .....		190	65	78	28.820	
31.79	1478	8.06	2001	4.35	9th	Gear .....		191	65	77	28.820	
30.67	1083	10.62	2000	3.48	10th	Gear .....		190	66	79	28.820	
MAXIMUM PULL WITHOUT BALLAST												
29.31	3216	3.42	2063	14.92	5th	Gear .....		187	52	65	28.900	

## VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—7th Gear

Pounds pull	2317	2517	2698	2744	2778	2731
Horsepower	32.46	31.49	29.84	26.50	22.92	18.89
Crankshaft speed rpm	2003	1802	1599	1401	1198	1005
Miles per hour	5.25	4.69	4.15	3.62	3.09	2.59
Slip of drivers, %	6.60	7.47	7.68	8.00	8.11	8.11

## TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 13.6-28; 4; 14	Two 13.6-28; 4; 14
	—Liquid	491 lb each	None
	Cast iron	362 lb each	None
Front tires	—No, size, ply & psi	Two 6.00-16; 4; 24	Two 6.00-16; 4; 24
	—Liquid	85 lb each	None
	Cast iron	None	None
Height of drawbar		22½ inches	23½ inches
Static weight with operator—Rear		4040 lb	2335 lb
	Front	1645 lb	1475 lb
	Total	5685 lb	3810 lb

## Department of Agricultural Engineering

Date of Test: April 28 to May 8, 1969

Manufacturer: MASSEY-FERGUSON INC.,  
DETROIT, MICHIGAN

**FUEL, OIL and TIME** Fuel Regular gasoline Octane No Motor 85.2 Research 92.6 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.7294 Weight per gallon 6.072 lb Oil SAE 20-20W API service classification MS, DM To motor 1.466 gal Drained from motor 1.167 gal Transmission and final-drive lubricant Massey-Ferguson Oil M 1101 Total time engine was operated 42 hours.

**ENGINE** Make Perkins gasoline Type 3 cylinder vertical Serial No 37111500X Crankshaft mounted lengthwise Rated rpm 2000 Bore and stroke 3.6" x 5" Compression ratio 7.5 to 1 Displacement 152.7 cu in Carburetor size 1½" Ignition system battery Cranking system 12 volt electric Lubrication pressure Air cleaner dry type with replaceable paper element and automatic dust unloader Fuel filter sediment bowl and screen Muffler was used Cooling medium temperature control thermostat.

**CHASSIS** Type standard Serial No GA 66314 Tread width rear 48" to 76" front 48" to 80" Wheel base 72" 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 31.3" Vertical distance above roadway 27.0" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system constant running except when PTO foot clutch is disengaged Transmission selective gear fixed ratio with partial range operator controlled power shifting Advertised speeds mph first 1.38 second 1.80 third 2.07 fourth 2.70 fifth 3.79 sixth 4.96 seventh 5.51 eighth 7.20 ninth 8.28 tenth 10.81 eleventh 15.17 twelfth 19.82 reverse 1.88, 2.45, 7.51, 9.81 Clutch single plate dry disc in combination with PTO clutch operated by single foot pedal Brakes expanding double shoe operated by two independent foot pedals that can be locked together Steering mechanical with power assist Turning radius (on concrete surface with brake applied) right 108" left 108" (on concrete surface without brake) right 118" left 118" Turning space diameter (on concrete surface with brake applied) right 223" left 223" (on concrete surface without brake) right 241" left 241" Belt pulley 1176 rpm at 1975 engine rpm diam 10¼" face 16½" Belt speed 3117 fpm Power take-off 540 rpm at 1700 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. During final inspection it was found that the exhaust valve seat insert in No. 2 cylinder was loose. First, second and third gears were not run as it was necessary to limit the pull in fourth gear because of the stability formula. Eleventh and twelfth gears were not run as both exceeded 15 mph. Occasional misfiring occurred during part throttle runs.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1009.

L. F. LARSEN

Engineer-In-Charge

G. W. STEINBRUEGGE, Chairman  
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. 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,  $\frac{1}{2}$  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. 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

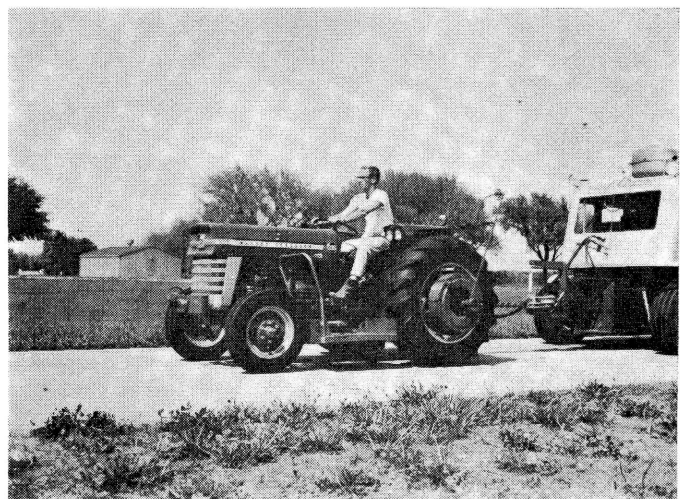
speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to 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 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 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 MF 135 GASOLINE