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Test 1022: Massey-Ferguson MF 1080 (Diesel)

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1022 – MASSEY-FERGUSON MF 1080 DIESEL

POWER TAKE-OFF PERFORMANCE

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 (1000 rpm PTO)									
81.23	2000	5.198	0.446	15.63	201	69	75	28.912	
Standard Power Take-off Speed (540 rpm)—One Hour									
73.79	1718	4.778	0.451	15.44	204	69	75	28.925	
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS									
71.90	2083	4.468	0.433	16.09	188	69	75	.....
0.00	2203	1.369	.....	.....	170	68	74	.....
37.04	2148	2.897	0.545	12.79	178	69	75	.....
81.00	1999	5.148	0.443	15.73	200	70	76	.....
18.74	2171	2.100	0.781	8.92	173	69	75	.....
54.87	2121	3.624	0.460	15.14	183	70	76	.....
Av	43.93	2121	3.268	0.518	13.44	182	69	75	28.917

DRAWBAR PERFORMANCE

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

VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST

Maximum Available Power—Two Hours—7th Gear (1st Hi-Lo MP)											
70.22	5121	5.14	2002	7.43	5.147	0.511	13.64	182	65	76	29.075
75% of Pull at Maximum Power—Ten Hours—7th Gear (1st Hi-Lo MP)											
58.66	4005	5.49	2098	5.59	4.239	0.504	13.84	172	55	64	28.966
50% of Pull at Maximum Power—Two Hours—7th Gear (1st Hi-Lo MP)											
40.45	2654	5.72	2143	3.84	3.305	0.569	12.24	168	51	55	28.855

MAXIMUM POWER WITH BALLAST

57.65	8949	2.42	2089	14.95	4th Gear (2nd Lo-Hi MP)		172	64	71	29.100
68.46	7669	3.35	1995	11.93	5th Gear (3rd Lo-Lo MP)		173	62	66	29.070
70.77	5808	4.57	2002	8.56	6th Gear (3rd Lo-Hi MP)		175	63	68	29.070
73.07	5338	5.13	2005	7.76	7th Gear (1st Hi-Lo MP)		175	64	72	29.070
72.43	3958	6.86	2005	5.56	8th Gear (1st Hi-Hi MP)		179	65	71	29.070
72.72	3446	7.91	2001	4.85	9th Gear (2nd Hi-Lo MP)		180	65	74	29.070
71.09	2543	10.48	2002	3.62	10th Gear (2nd Hi-Hi MP)		181	65	74	29.070
66.51	1679	14.85	2000	2.51	11th Gear (3rd Hi-Lo MP)		178	65	73	29.070

MAXIMUM PULL WITHOUT BALLAST

63.89	5496	4.36	2003	14.86	6th Gear (3rd Lo-Hi MP)		190	64	81	28.690
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VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 7th Gear (1st Hi-Lo MP)

Pounds Pull	5338	5668	5813	5841	5796	5534
Horsepower	73.07	69.42	63.27	55.60	47.30	37.25
Crankshaft speed rpm	2005	1803	1610	1406	1206	990
Miles per hour	5.13	4.59	4.08	3.57	3.06	2.52
Slip of drivers, %	7.76	8.10	8.50	8.50	8.50	8.23

TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 18.4-34; 6; 16	Two 18.4-34; 6; 16
	—Liquid	1003 lb each	None
	Cast iron	700 lb each	None
Front tires	—No, size, ply & psi	Two 7.50-18; 6; 32	Two 7.50-18; 6; 32
	—Liquid	None	None
	Cast iron	33 lb each	None
Height of drawbar		21 inches	23 inches
Static weight with operator—Rear		9050 lb	5645 lb
	Front	2940 lb	2875 lb
	Total	11990 lb	8520 lb

Department of Agricultural Engineering

Dates of Test: September 12 to September 25, 1969

Manufacturer: MASSEY-FERGUSON, INC., DETROIT, MICHIGAN

FUEL, OIL and TIME Fuel No 2 diesel Cetane 52.2 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8371 Weight per gallon 6.970 lb Oil SAE 20-20W API service classification MS-DS To motor 3.126 gal Drained from motor 2.149 gal Transmission and final-drive lubricant Massey-Ferguson oil M-1129A Total time engine was operated 42.5 hours.

ENGINE Make Perkins Diesel Type 4 cylinder vertical Serial No 318UA 1536 Crankshaft mounted lengthwise Rated rpm 2000 Bore and stroke 4.5" to 5.0" Compression ratio 17.5 to 1 Displacement 318 cu in Cranking system 12 volt electric Lubrication pressure Air cleaner dry type with replaceable pleated paper element Oil filter full flow with replaceable pleated paper element Oil cooler radiator for transmission and hydraulic oil Fuel filter primary and secondary filters with replaceable paper elements Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No 9B 20809 Tread width rear 60" to 96" front 56" to 80" Wheel base 97.7" 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 34.2" Vertical distance above roadway 33.3" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system direct drive Transmission selective gear fixed ratio with partial range operator controlled power shifting Advertised speeds mph first 1.33 second 1.75 third 2.03 fourth 2.65 fifth 3.70 sixth 4.85 seventh 5.38 eighth 7.02 ninth 8.10 tenth 10.58 eleventh 14.81 twelfth 19.38 reverse 1.85, 2.41, 7.33 and 9.60 Clutch single plate dry disc operated by foot pedal Brakes double disc operated by two foot pedals which can be locked together Steering Hydrostatic Turning radius (on concrete surface with brake applied) right 129" left 129" (on concrete surface without brake) right 146" left 146" Turning space diameter (on concrete surface with brake applied) right 258" left 258" (on concrete surface without brake) right 292" left 292" Power take-off 1000 rpm at 2000 engine rpm and 540 rpm at 1718 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, second, and third gears were not run as it was necessary to limit the pull in fourth 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 1022.

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

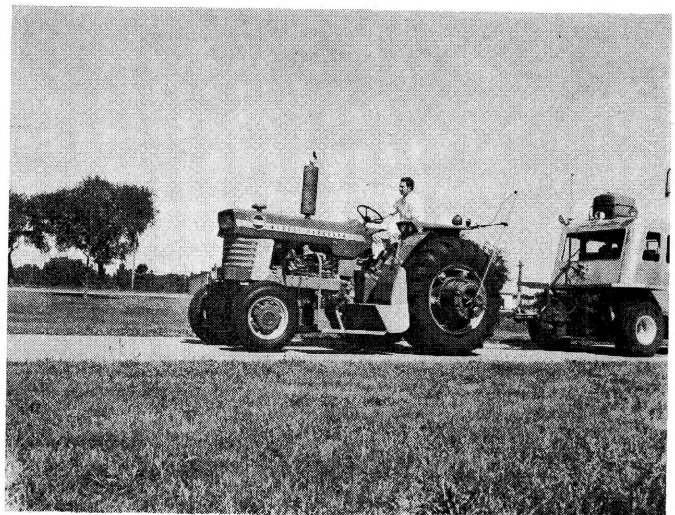
speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to 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 1080 DIESEL