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Test 948: Maasey-Ferguson MF 1130 (Diesel)

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 948 - MASSEY-FERGUSON MF 1130 DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crank- shaft speed rpm	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		
MAXIMUM POWER AND FUEL CONSUMPTION									
*	Rated Engine Speed—Two Hours								
120.51	2201	7.596	0.439	15.86	187	56	75	28.963	
Standard Power Take-off Speed (1000 rpm)—One Hour									
117.35	2000	7.062	0.419	16.62	189	58	75	28.965	
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS									
105.06	2258	6.979	0.463	15.05	183	59	75	.....
0.00	2343	2.102	.....	.....	169	58	74	.....
53.64	2300	4.571	0.593	11.73	175	59	76	.....
120.68	2199	7.655	0.442	15.76	187	59	75	.....
27.11	2324	3.395	0.872	7.99	171	58	75	.....
79.63	2283	5.712	0.500	13.94	178	58	74	.....
Av	64.35	2284	5.069	0.549	12.69	177	58	75	28.957

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	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	

VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST

Maximum Available Power—Two Hours—5th Gear (3rd Lo-Lo MP)											
106.91	8733	4.59	2200	5.83	7.481	0.487	14.29	193	58	76	28.620
75% of Pull at Maximum Power—Ten Hours—5th Gear (3rd Lo-Lo MP)											
86.71	6757	4.81	2271	4.33	6.591	0.529	13.16	168	66	74	28.483
50% of Pull at Maximum Power—Two Hours—5th Gear (3rd Lo-Lo MP)											
60.94	4610	4.96	2305	2.98	5.088	0.581	11.98	174	63	63	28.550

MAXIMUM POWER WITH BALLAST

92.66	14182	2.45	2230	14.83	2nd Gear (1st Lo-Hi MP)			189	71	82	28.460
104.66	12131	3.24	2198	9.01	3rd Gear (2nd Lo-Lo MP)			189	71	82	28.460
105.61	9417	4.21	2203	6.13	4th Gear (2nd Lo-Hi MP)			191	69	80	28.640
109.65	8970	4.58	2198	5.83	5th Gear (3rd Lo-Lo MP)			191	58	78	28.680
105.78	6740	5.89	2203	4.27	6th Gear (3rd Lo-Hi MP)			193	69	80	28.640
109.27	6603	6.21	2202	4.27	7th Gear (1st Hi-Lo MP)			193	69	80	28.640
106.20	5029	7.92	2202	2.90	8th Gear (1st Hi-Hi MP)			178	65	74	28.550
106.09	3998	9.95	2196	2.33	9th Gear (2nd Hi-Lo MP)			176	65	74	28.550
99.87	2963	12.64	2200	1.66	10th Gear (2nd Hi-Hi MP)			182	65	74	28.550
102.75	2794	13.79	2201	1.58	11th Gear (3rd Hi-Lo MP)			175	65	74	28.550

MAXIMUM POWER WITHOUT BALLAST

107.37	9251	4.35	2195	10.63	5th Gear (3rd Lo-Lo MP)			181	46	57	28.870
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VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—5th Gear (3rd Lo-Lo MP)

Pounds pull	8970	9376	9840	9772	9229	8774
Horsepower	109.65	102.94	95.87	83.24	67.65	53.55
Crankshaft speed, rpm	2198	1982	1765	1541	1322	1097
Miles per hour	4.58	4.12	3.65	3.19	2.75	2.29
Slip of drivers, %	5.83	6.36	6.66	6.51	6.05	5.90

TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 24.5-32; 10; 16	Two 24.5-32; 10; 16
	—Liquid	1495 lb each	None
	—Cast iron	900 lb each	None
Front tires	—No, size, ply & psi	Two 11.00-16; 6; 28	Two 11.00-16; 6; 28
	—Liquid	None	None
	—Cast iron	None	None
Height of drawbar		20 inches	20½ inches
Static weight with operator—	Rear	14470 lb	9680 lb
	Front	3990 lb	3880 lb
	Total	18460 lb	13560 lb

Department of Agricultural Engineering

Dates of Test: OCTOBER 7 TO OCTOBER 19, 1966

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

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° 0.8363 Weight per gallon 6.964 lb Oil SAE 20-20W API service classification MS, DS To motor 4.050 gal Drained from motor 3.324 gal Transmission and final-drive lubricant Massey-Ferguson oil M-1127 Total time engine was operated 47 hours.

ENGINE Make Perkins Diesel Type 6 cylinder vertical with turbo charger Serial No 354UA602T Crankshaft mounted lengthwise Rated rpm 2200 Bore and stroke 3.875" x 5" Compression ratio 16 to 1 Displacement 354 cu in Cranking system 12 volt electric Lubrication pressure Air cleaner dry type with replaceable paper element Oil filter replaceable paper cartridge Oil cooler engine coolant heat exchanger for crankcase oil and radiator for transmission and hydraulic oil Fuel filter primary filter with replaceable paper cartridge and agglomerator, and final filter with replaceable paper cartridge Muffler was not used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No RDW651-500133 Tread width rear 72" to 94" front 60" Wheel base 102.06" 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 30.6" Vertical distance above roadway 36.0" 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 Advertised speeds mph first 2.13 second 2.68 third 3.35 fourth 4.23 fifth 4.60 sixth 5.80 seventh 6.12 eighth 7.71 ninth 9.65 tenth 12.15 eleventh 13.24 twelfth 16.70 reverse first 1.74 second 2.19 third 5.00 fourth 6.30 Clutch single plate dry disc operated by foot pedal Brakes double disc hydraulically power actuated operated by two foot pedals which can be locked together Steering hydraulic with power assist Turning radius (on concrete surface with brake applied) right 140" left 140" (on concrete surface without brake) right 164" left 164" Turning space diameter (on concrete surface with brake applied) right 280" left 280" (on concrete surface without brake) right 280" left 280" Belt pulley none Power take-off 540 or 1000 rpm at 2000 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. 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 948.

L. F. LARSEN

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

J. J. SULEK

D. E. LANE

Board of Tractor Test Engineers

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

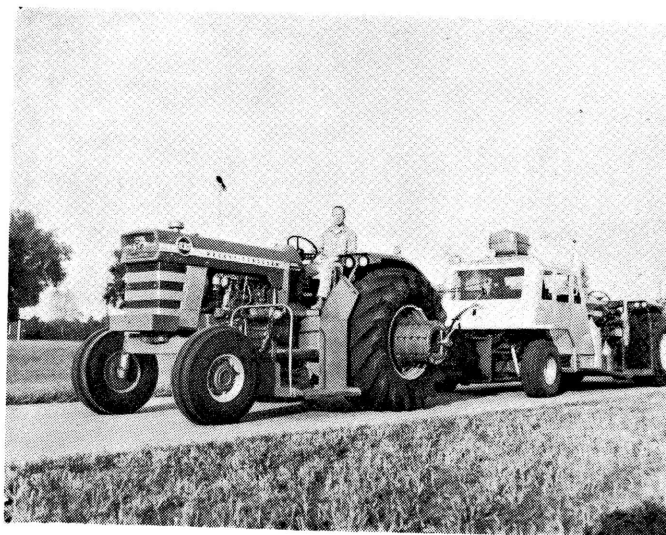
mission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the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



Massey-Ferguson MF 1130 Diesel