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Test 1133: Massey-Ferguson 1085 Diesel

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1133 – MASSEY-FERGUSON 1085 DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling medium	Temperature Degrees F Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1000 rpm)								
81.58	2000	5.157	0.444	15.82	196	65	75	28.877
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
72.33	2087	4.562	0.443	15.85	189	66	77	.....
0.00	2201	1.569	.....	.....	181	65	75	.....
37.25	2143	2.899	0.546	12.85	184	65	75	.....
81.79	2000	5.135	0.441	15.93	198	66	77	.....
18.89	2174	2.215	0.823	8.53	182	65	77	.....
54.66	2107	3.677	0.472	14.87	186	65	77	.....
Av 44.15	2119	3.343	0.531	13.21	186	65	76	28.890

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temp Degrees F 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 (1 Hi Lo MP)											
69.16	4665	5.56	1992	3.99	5.148	0.522	13.43	190	60	68	28.900
75% of Pull at Maximum Power—Ten Hours—7th Gear (1 Hi Lo MP)											
56.84	3616	5.89	2097	3.30	4.321	0.533	13.15	185	62	64	28.739
50% of Pull at Maximum Power—Two Hours—7th Gear (1 Hi Lo MP)											
39.08	2422	6.05	2123	1.97	3.384	0.607	11.55	184	75	88	28.690
50% of Pull at Reduced Engine Speed—Two Hours—9th Gear (2 Hi Lo MP)											
38.03	2386	5.98	1429	1.86	2.565	0.473	14.83	185	74	86	28.655
MAXIMUM POWER WITH BALLAST											
52.51	10355	1.90	2097	14.90	3rd Gear (2 Lo Lo MP)	185	65	75	28.800		
64.53	9735	2.49	1997	10.66	4th Gear (2Lo Hi MP)	193	70	80	28.820		
67.92	6955	3.66	1998	6.32	5th Gear (3 Lo Lo MP)	195	71	81	28.820		
70.76	4754	5.58	1999	3.99	7th Gear (1 Hi Lo MP)	192	67	70	28.580		
69.93	3554	7.38	2000	2.94	8th Gear (1 Hi Hi MP)	191	67	70	28.580		
69.02	3115	8.31	1998	2.48	9th Gear (2 Hi Lo MP)	192	67	70	28.580		

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 7th Gear (1 Hi Lo MP)

Pounds Pull	4754	5039	5269	5345	5371	5208
Horsepower	70.76	67.38	62.38	55.12	47.54	38.45
Crankshaft Speed rpm	1999	1801	1598	1394	1196	997
Miles Per Hour	5.58	5.01	4.44	3.87	3.32	2.77
Slip of Drivers %	3.99	4.07	4.51	4.66	4.66	4.36

TRACTOR SOUND LEVEL (with cab) db (A)

Maximum Available Power 2 Hours	85.0
75% of Pull at Max. Power 10 Hours	83.5
50% of Pull at Max. Power 2 Hours	82.5
50% of Pull at Reduced Engine Speed 2 Hours	79.5
Bystander 12th Gear (3 Hi Hi MP)	87.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 23.1-30;8;16	Two 23.1-30;8;16
Ballast	—Liquid	1430 lb each	None
	Cast Iron	None	None
Front Tires	—No., size, ply & psi	Two 7.50-18;6;40	Two 7.50-18;6;40
Ballast	—Liquid	None	None
	Cast Iron	None	None
Height of drawbar		22 inches	22½ inches
Static weight with operator—Rear		10680 lb	7820 lb
	Front	3705 lb	3720 lb
	Total	14385 lb	11540 lb

Department of Agricultural Engineering

Dates of Test: May 29 to June 8, 1973

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

FUEL, OIL AND TIME Fuel No 2 Diesel Cetane No 50.1 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8427 Weight per gallon 7.017 lb Oil SAE 20-20W API service classification SB/SE-CA/CC (Formerly MS DM) To motor 2.937 gal Drained from motor 2.203 gal Transmission and final drive lubricant Massey-Ferguson oil M-1129A Total time engine was operated 46 hours.

ENGINE Make Perkins Diesel Type 4 cylinder vertical Serial No 318UA12874 Crankshaft Mounted lengthwise Rated rpm 2000 Bore and stroke 4.5" x 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 pleated paper elements Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No 9B38315 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 centerline 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 engine drive Transmission selective gear fixed ratio with partial range operator controlled power shifting Advertised speeds mph first 1.4 second 1.8 third 2.1 fourth 2.8 fifth 3.9 sixth 5.1 seventh 5.6 eighth 7.4 ninth 8.5 tenth 10.8 eleventh 15.5 twelfth 20.3 reverse 1.9, 2.1 7.7 & 10.1 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 at 1700 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure.

First and second gears were not run as it was necessary to limit the pull in third gear to avoid excessive wheel slippage.

Sixth, tenth, eleventh, and twelfth gears were not run as test procedure requires only six travel speeds.

We, the undersigned, certify that this is a true and correct report of official tractor Test 1133.

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. Prior to the maximum power run the tire tread-bar height must be at least 65% of new tread height.

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 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.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effects 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 4 different runs 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; (3) 50% of the pull at maximum power; and (4) maintaining the same load and travel speed as in (3) by shifting to a higher gear and reducing the engine rpm.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 6 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 manufacturer's representative has the option of selecting one gear or speed over eight miles per hour. 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.

Varying Drawbar Pull 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.

SOUND MEASUREMENT

Sound is recorded during each of the Varying Power and Fuel Consumption runs as the tractor travels on a straight section of the test course. The dB(A) sound level is obtained with the microphone located near the right ear of the operator. Bystander sound readings are taken with the microphone placed 25 feet from the line of travel of the tractor.

An increase of 10 dB(A) will approximately double the loudness to the human ear.

For additional information about the Nebraska Tractor Tests write to the Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska 68503.



MASSEY-FERGUSON 1085 DIESEL