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Test 1190: Massey-Ferguson MF 255 Gasoline

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1190 – MASSEY-FERGUSON MF 255 GASOLINE

POWER TAKE-OFF PERFORMANCE

Hp	Crank- shaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—642 rpm)								
50.01	2000	4.716	0.571	10.60	178	59	75	29.047
Standard Power Take-off Speed (540 rpm)—One Hour								
47.14	1684	4.322	0.556	10.91	179	60	75	29.085
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
44.24	2082	4.184	0.573	10.57	175	61	75	.....
0.00	2212	1.971	.....	.....	163	60	75	.....
23.00	2166	3.164	0.833	7.27	176	61	75	.....
49.83	2001	4.709	0.573	10.58	178	60	74	.....
11.71	2201	2.570	1.329	4.56	168	61	76	.....
33.70	2114	3.713	0.668	9.08	176	61	75	.....
Av 27.08	2129	3.385	0.757	8.00	173	60	75	29.077

DRAWBAR PERFORMANCE

Hp	Draw- bar pull lbs	Speed miles per hr	Crank- shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool- ing 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 (1 H L) Gear											
42.22	3007	5.26	1998	6.66	4.724	0.678	8.94	180	53	71	29.050
75% of Pull at Maximum Power—Ten Hours 7th (1 H L) Gear											
35.31	2324	5.70	2123	4.91	4.134	0.709	8.54	176	49	57	29.298
50% of Pull at Maximum Power—Two Hours 7th (1 H L) Gear											
23.99	1518	5.93	2176	3.55	3.569	0.901	6.72	175	41	45	29.230
50% of Pull at Reduced Engine Speed—Two Hours 9th (2 H L) Gear											
24.67	1570	5.89	1473	3.36	2.909	0.714	8.48	171	50	61	29.215

MAXIMUM POWER WITH BALLAST

36.01	5668	2.38	2065	14.85	4th Gear (2 L H)	172	38	40	29.220
40.99	4571	3.36	2001	11.45	5th Gear (3 L L)	182	55	71	29.050
42.07	3431	4.60	2001	7.48	6th Gear (3 L H)	180	55	70	29.050
43.49	3091	5.28	2001	6.60	7th Gear (1 H L)	179	55	70	29.050
42.80	2284	7.03	2000	4.71	8th Gear (1 H H)	181	54	72	29.050
42.89	2028	7.93	2000	4.15	9th Gear (2 H L)	179	54	72	29.050

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—7th (1 H L) Gear

Pounds Pull	3091	3337	3548	3652	3679	3546
Horsepower	43.49	41.82	39.29	35.31	30.54	24.87
Crankshaft Speed rpm	2001	1796	1597	1401	1204	1011
Miles Per Hour	5.28	4.70	4.15	3.63	3.11	2.63
Slip of Drivers %	6.60	7.31	8.01	8.35	8.35	8.01

TRACTOR SOUND LEVEL (Without Cab) db(A)

Maximum Available Power 2 Hours	95.0
75% of Pull at Max. Power 10 Hours	94.0
50% of Pull at Max. Power 2 Hours	93.0
50% of Pull at Reduced Engine Speed 2 Hours	91.5
Bystander (in 12th—3 H H—Gear)	85.0

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 16.9-28; 6; 16	Two 16.9-28; 6; 16
Ballast	—Liquid	570 lb each	None
	Cast Iron	None	None
Front Tires	—No., size, ply & psi	Two 7.5L-15; 6; 32	Two 7.5L-15; 6; 32
Ballast	—Liquid	None	None
	Cast Iron	None	None
Height of drawbar		20 inches	20 inches
Static weight with operator—rear		5170 lb	4030 lb
front		2110 lb	2110 lb
total		7280 lb	6140 lb

Department of Agricultural Engineering

Dates of Test: September 4 to 25, 1975

Manufacturer: MASSEY-FERGUSON INC.

1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME Fuel no lead gasoline Octane No. Motor 82.2 Research 91.8 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.7279 Weight per gallon 6.059 lb Oil SAE 20-20W API service classification SB/SE-CA/CC To motor 1.726 gal Drained from motor 1.586 gal Transmission and final drive lubricant Massey-Ferguson Oil M-1129(A) Total time engine was operated 45.0 hours.

ENGINE Make Perkins Type 4 cylinder vertical Serial No 5802A Crankshaft Mounted lengthwise Rated rpm 2000 Bore and stroke 3.875" x 4.5" Compression ratio 7 to 1 Displacement 212 cu. in. Carburetor size 1.29" Ignition system battery Cranking system 12 volt Lubrication pressure Air cleaner dry dual pleated paper element Oil filter full flow paper cartridge Fuel filter in-line replaceable filter Muffler vertical Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No. 9A 221 954 Tread width rear 56" to 90" front 48" to 80" Wheel base 82" 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 27.4" Vertical distance above roadway 32.4" Horizontal distance from center of rear wheel tread 0.3" to the right Hydraulic control system constant running except when PTO clutch is disengaged Transmission selective gear fixed ratio with partial range operator controlled power shift Advertised speeds mph first 1.4 second 1.8 third 2.0 fourth 2.6 fifth 3.6 sixth 4.8 seventh 5.4 eighth 7.1 ninth 7.9 tenth 10.4 eleventh 14.5 twelfth 19.0 reverse 1.8, 2.4, 7.4 and 9.6 Clutch single plate dry disc operated by foot pedal Brakes double plate dry disc operated by two foot pedals which can be locked together Steering power assist Turning radius (on concrete surface with brake applied) right 116.5" left 118" (on concrete surface without brake) right 128" left 125.5" Turning space diameter (on concrete surface with brake applied) right 241" left 234" (on concrete surface without brake) right 263" left 260" Power take-off 540 rpm at 1684 engine rpm.

REPAIRS AND ADJUSTMENTS: #27 main jet in carburetor was replaced with #28 jet.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Six gears were chosen between 15% slip and 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1190.

LOUIS I. LEVITICUS

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

D. E. LANE

Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories may be disconnected only when the means for disconnecting can be reached from the operator station. 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 use.

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 mph. The slip 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 68583.



MASSEY-FERGUSON MF 255 GASOLINE