

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1981

Test 1411: Massey-Ferguson MF 154-4 Diesel 12-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Nebraska Tractor Test Lab, "Test 1411: Massey-Ferguson MF 154-4 Diesel 12-Speed" (1981). *Nebraska Tractor Tests*. 1727.

<https://digitalcommons.unl.edu/tractormuseumlit/1727>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA TRACTOR TEST 1411 — MASSEY-FERGUSON MF 154-4 DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption			Temperature °F (°C)				Barometer inch Hg (kPa)
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb		

MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—Two Hours (PTO Speed—625 rpm)									
42.52 (31.71)	2250	2.599 (9.838)	0.421 (0.256)	16.36 (3.223)	190 (87.7)	60 (15.6)	75 (23.8)		28.953 (97.771)

Standard Power Take-off Speed (540 rpm)—One Hour									
40.38 (30.11)	1943	2.339 (8.854)	0.399 (0.243)	17.26 (3.401)	190 (87.8)	61 (15.9)	75 (23.9)		28.960 (97.794)

VARYING POWER AND FUEL CONSUMPTION—Two Hours

36.93 (27.54)	2298	2.280 (8.631)	0.426 (0.259)	16.20 (3.191)	187 (86.1)	61 (15.8)	75 (23.9)		.....
0.00 (0.00)	2380	0.774 (2.930)	.....	.....	183 (83.6)	60 (15.6)	75 (23.6)		.....
18.84 (14.05)	2344	1.484 (5.618)	0.543 (0.330)	12.70 (2.501)	184 (84.4)	60 (15.6)	74 (23.3)		.....
42.57 (31.74)	2250	2.611 (9.884)	0.423 (0.257)	16.31 (3.211)	190 (87.8)	60 (15.6)	75 (23.9)		.....
9.52 (7.10)	2368	1.109 (4.198)	0.804 (0.489)	8.58 (1.691)	183 (83.6)	60 (15.6)	74 (23.3)		.....
27.88 (20.79)	2314	1.867 (7.067)	0.462 (0.281)	14.94 (2.942)	185 (85.0)	60 (15.6)	75 (23.9)		.....
Av Av	22.62 (16.87)	2326	1.687 (6.386)	0.514 (0.313)	13.41 (2.642)	185 (85.1)	60 (15.6)	75 (23.7)	28.955 (97.777)

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 8th Gear											
34.75 (25.91)	2867 (12.75)	4.54 (7.31)	2250	9.11	2.520 (9.539)	0.500 (0.304)	13.79 (2.716)	183 (83.9)	53 (11.7)	57 (13.9)	28.660 (96.781)
75% of Pull at Maximum Power—Ten Hours 8th Gear											
27.87 (20.78)	2202 (9.80)	4.75 (7.64)	2294	6.91	2.143 (8.112)	0.530 (0.323)	13.00 (2.562)	181 (82.8)	51 (10.4)	57 (13.8)	29.013 (97.973)
50% of Pull at Maximum Power—Two Hours 8th Gear											
19.47 (14.52)	1479 (6.58)	4.94 (7.94)	2325	4.50	1.704 (6.451)	0.604 (0.367)	11.42 (2.251)	181 (82.8)	53 (11.7)	65 (18.3)	29.145 (98.418)
50% of Pull at Reduced Engine Speed—Two Hours 10th Gear											
19.53 (14.56)	1484 (6.60)	4.94 (7.95)	1503	4.35	1.360 (5.147)	0.480 (0.292)	14.36 (2.830)	179 (81.7)	54 (12.2)	58 (14.4)	28.620 (96.645)

MAXIMUM POWER IN SELECTED GEARS

29.76 (22.19)	4144 (18.44)	2.69 (4.33)	2273	14.92	6th Gear			181 (82.8)	55 (12.8)	64 (17.8)	28.620 (96.645)
34.30 (25.58)	3733 (16.60)	3.45 (5.55)	2250	13.17	7th Gear			184 (84.4)	52 (11.1)	62 (16.7)	29.180 (98.536)
35.40 (26.39)	2936 (13.06)	4.52 (7.27)	2248	9.50	8th Gear			184 (84.2)	50 (10.0)	59 (15.0)	29.200 (98.604)
35.16 (26.22)	2293 (10.20)	5.75 (9.25)	2247	7.19	9th Gear			184 (84.4)	52 (11.1)	62 (16.7)	29.180 (98.536)
35.11 (26.18)	1808 (8.04)	7.28 (11.72)	2250	5.62	10th Gear			184 (84.4)	52 (11.1)	63 (17.2)	29.180 (98.536)
33.90 (25.28)	1358 (6.04)	9.36 (15.07)	2249	4.24	11th Gear			184 (84.4)	52 (11.1)	63 (17.2)	29.150 (98.435)

Department of Agricultural Engineering

Dates of Test: October 12-19, 1981

Manufacturer: MASSEY FERGUSON S.p.A
LANDINI DIVISION Via Matteotti 17,42042
Fabbrico (RE), Italy

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 46.3 (rating taken from oil company's
inspection data) Specific gravity converted to 60°/
60° (15°/15°) 0.8281 Fuel weight 6.895 lbs/gal
(0.826 kg/l) Oil SAE 20-20W API service classi-
fication SB/SE-CA/CC To motor 1.485 gal
(5.619 l) Drained from motor 1.140 gal (4.314 l)
Transmission and final drive lubricant MF Per-
matran fluid Total time engine was operated
46.0 hours.

ENGINE: Make Perkins Diesel Type three
cylinder vertical Serial No. CE21899U627706G
Crankshaft lengthwise Rated rpm 2250 Core
and stroke 3.6" × 5.0" (91.4 mm × 127 mm) Com-
pression ratio 16.5 to 1 Displacement 153 cu in
(2502 ml) Starting system 12 volt Lubrication
pressure Air cleaner oil bath with centrifugal
precleaner Oil filter one full flow paper
cartridge Fuel filter one paper element Muffler
vertical Cooling medium temperature control
one thermostat.

CHASSIS: Type front wheel assist Serial No.
2227212 Tread width rear 55.1" (1400 mm) to
74.8" (1900 mm) front 59.1" (1500 mm) Wheel
base 81.1" (2060 mm) 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 34.5" (876 mm) Vertical distance above
roadway 28.9" (733 mm) Horizontal distance from
center of rear wheel tread 0" (0 mm) to the right/
left Hydraulic control system direct engine
drive Transmission selective gear fixed ratio
Advertised speeds mph (km/h) first 0.8 (1.3)
second 1.3 (2.0) third 1.6 (2.6) fourth 2.0 (3.2)
fifth 2.5 (4.0) sixth 3.1 (5.0) seventh 3.9 (6.3)
eighth 4.9 (8.0) ninth 6.1 (9.9) tenth 7.6 (12.3)
eleventh 9.7 (15.5) twelfth 15.1 (24.3) reverse 2.1
(3.4), 3.3 (5.3), 4.2 (6.7), 6.5 (10.5) Clutch dry disc
operated by foot pedal Brakes dry disc operated
by two foot pedals which can be locked together
and hand lever Steering hydrostatic Turning
radius (on concrete surface with brake applied)
right 156.1" (3.96 m) left 160.3" (4.07 m) (on con-
crete surface without brake) right 184.9" (4.70 m)
left 185.3" (4.71 m) Turning space diameter (on
concrete surface with brake applied) right 323.2"
(8.21 m) left 331.5" (8.42 m) (on concrete surface
without brake) right 380.8" (9.67 m) left 381.7"
(9.69 m) Power take-off 540 rpm at 1943 engine
rpm.

REPAIRS and ADJUSTMENTS: No repairs or
adjustments.

LUGGING ABILITY IN 8th GEAR

Crankshaft Speed rpm	2248	2027	1800	1577	1348	1128
Pull—lbs (kN)	2936 (13.06)	3176 (14.13)	3379 (15.03)	3531 (15.71)	3572 (15.89)	3489 (15.52)
Increase in Pull %	0	8	15	20	22	19
Power—Hp (kW)	35.40 (26.39)	34.06 (25.40)	31.93 (23.81)	29.01 (21.64)	25.02 (18.66)	20.53 (15.31)
Speed—Mph (km/h)	4.52 (7.27)	4.02 (6.47)	3.54 (5.70)	3.08 (4.96)	2.63 (4.23)	2.21 (3.55)
Slip %	9.50	10.69	11.40	12.10	12.20	11.90

TRACTOR SOUND LEVEL WITHOUT CAB	Front Wheel Drive	
	dB(A)	Disengaged dB(A)
Maximum Available Power—Two Hours	98.5	98.5
75% of Pull at Maximum Power—Ten Hours		97.0
50% of Pull at Maximum Power—Two Hours		96.5
50% of Pull at Reduced Engine Speed—Two Hours		93.0
Bystander in 12th gear		88.5

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 8th Gear											
35.56 (26.52)	2847 (12.67)	4.68 (7.54)	2250	6.28	2.520 (9.539)	0.489 (0.297)	14.11 (2.780)	184 (84.2)	51 (10.6)	65 (18.3)	28.930 (97.692)

MAXIMUM POWER IN SELECTED GEARS

29.87 (22.28)	5138 (22.85)	2.18 (3.51)	2273	14.93	5th Gear	181 (82.8)	55 (12.8)	62 (16.7)	28.610 (96.612)
36.45 (27.18)	2924 (13.00)	4.68 (7.52)	2251	6.48	8th Gear	184 (84.4)	51 (10.6)	61 (16.1)	29.190 (98.570)

TIRES, BALLAST AND WEIGHT

Rear Tires	—No., size, ply & psi (<i>kPa</i>)	Two 13.6-28; 6; 18 (<i>125</i>)	Two 13.6-28; 6; 18 (<i>125</i>)
Ballast	—Liquid (each)	463 lb (<i>210 kg</i>)	None
	—Cast Iron (each)	305 lb (<i>138 kg</i>)	None
Front Tires	—No., size, ply & psi (<i>kPa</i>)	Two 9.5-20; 4; 18 (<i>125</i>)	Two 9.5-20; 4; 18 (<i>125</i>)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	40 lb (<i>18 kg</i>)	None
Height of Drawbar		21.5 in (<i>545 mm</i>)	21.5 in (<i>545 mm</i>)
Static Weight with Operator —Rear		4660 lb (<i>2114 kg</i>)	3125 lb (<i>1417 kg</i>)
	Front	2260 lb (<i>1025 kg</i>)	2180 lb (<i>989 kg</i>)
	Total	6920 lb (<i>3139 kg</i>)	5305 lb (<i>2406 kg</i>)

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 149°F (65.0°C). Six gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1411.

LOUIS I. LEVITICUS

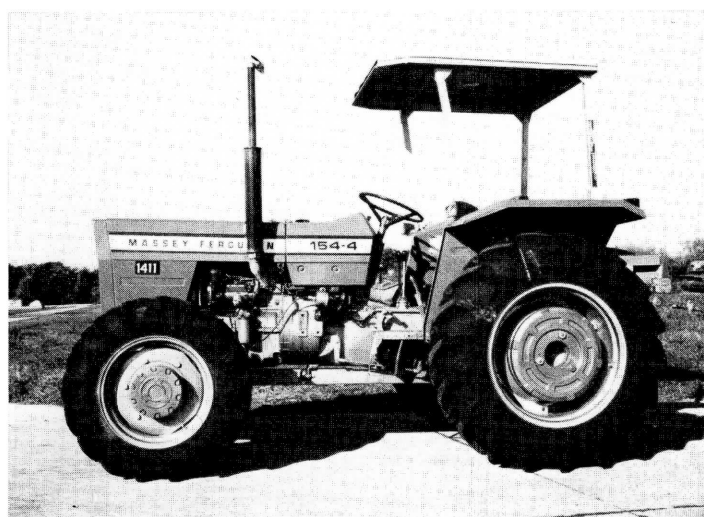
Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers



Massey Ferguson MF 154-4 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
Roy G. Arnold, Director