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1-1-1980

## Test 1366: Massey-Ferguson MF210-4 Diesel 12-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# NEBRASKA TRACTOR TEST 1366 — MASSEY-FERGUSON MF210-4 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—580 rpm)									
21.77 (16.23)	2500	1.696 (6.420)	0.543 (0.331)	12.84 (2.528)	179 (81.4)	60 (15.4)	75 (23.9)	29.017 (97.985)	
Standard Power Take-off Speed (540 rpm)—One Hour									
21.02 (15.67)	2326	1.594 (6.034)	0.529 (0.322)	13.18 (2.597)	178 (80.9)	59 (15.0)	75 (24.1)	29.005 (97.946)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
19.31 (14.40)	2608	1.479 (5.599)	0.535 (0.325)	13.05 (2.572)	176 (79.7)	59 (15.0)	76 (24.2)	..... .....	
0.00 (0.00)	2735	0.525 (1.987)	..... .....	..... .....	169 (76.1)	59 (15.0)	75 (23.9)	..... .....	
9.86 (7.35)	2664	0.946 (3.581)	0.669 (0.407)	10.42 (2.052)	173 (78.3)	59 (15.0)	75 (23.9)	..... .....	
21.96 (16.38)	2500	1.712 (6.481)	0.544 (0.331)	12.83 (2.527)	178 (80.8)	59 (15.0)	76 (24.2)	..... .....	
5.01 (3.74)	2704	0.740 (2.801)	1.031 (0.627)	6.77 (1.335)	171 (76.9)	59 (15.0)	75 (23.9)	..... .....	
14.64 (10.92)	2636	1.183 (4.478)	0.564 (0.343)	12.38 (2.439)	174 (78.9)	59 (15.0)	75 (23.9)	..... .....	
Av Av	11.80 (8.80)	2641	1.097 (4.153)	0.649 (0.395)	10.75 (2.119)	173 (78.5)	59 (15.0)	75 (24.0)	29.007 (97.951)

## 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)				
					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 10th (H2) Gear											
16.97 (12.65)	1233 (5.48)	5.16 (8.31)	2500	9.12	1.702 (6.444)	0.700 (0.426)	9.97 (1.963)	177 (80.3)	60 (15.3)	74 (23.3)	28.850 (97.422)
75% of Pull at Maximum Power—Ten Hours 10th (H2) Gear											
14.25 (10.63)	963 (4.28)	5.55 (8.94)	2623	6.74	1.365 (5.169)	0.668 (0.406)	10.44 (2.057)	173 (78.4)	50 (9.8)	60 (15.8)	29.165 (98.486)
50% of Pull at Maximum Power—Two Hours 10th (H2) Gear											
9.87 (7.36)	641 (2.85)	5.77 (9.29)	2668	4.68	1.147 (4.341)	0.811 (0.493)	8.61 (1.695)	173 (78.1)	48 (8.6)	57 (13.6)	29.270 (98.840)
50% of Pull at Reduced Engine Speed—Two Hours 11th (H3) Gear											
9.93 (7.41)	645 (2.87)	5.78 (9.30)	2041	4.58	0.950 (3.595)	0.667 (0.406)	10.46 (2.061)	170 (76.7)	52 (10.8)	66 (18.9)	29.235 (98.722)
MAXIMUM POWER IN SELECTED GEARS											
13.64 (10.17)	2158 (9.60)	2.37 (3.81)	2643	14.72	8th (M4) Gear		168 (75.6)	36 (2.2)	39 (3.9)	29.260 (98.807)	
17.00 (12.68)	1857 (8.26)	3.43 (5.53)	2500	14.69	9th (H1) Gear		176 (80.0)	56 (13.3)	67 (19.4)	28.900 (97.591)	
17.60 (13.13)	1278 (5.68)	5.17 (8.32)	2498	8.91	10th (H2) Gear		176 (80.0)	52 (11.1)	62 (16.7)	28.900 (97.591)	
17.60 (13.12)	955 (4.25)	6.91 (11.12)	2498	6.80	11th (H3) Gear		177 (80.6)	57 (13.9)	69 (20.6)	28.880 (97.523)	
LUGGING ABILITY IN 10th (H2) GEAR											
Crankshaft Speed rpm				2498	2256	2001	1746	1493	1247		
Pull—lbs (kN)				1278 (5.68)	1347 (5.99)	1431 (6.37)	1482 (6.59)	1536 (6.83)	1496 (6.65)		
Increase in Pull %				0	5	12	16	20	17		
Power—Hp (kW)				17.60 (13.13)	16.72 (12.47)	15.63 (11.65)	14.02 (10.45)	12.37 (9.22)	10.09 (7.52)		
Speed—Mph (km/h)				5.17 (8.32)	4.65 (7.49)	4.09 (6.59)	3.55 (5.71)	3.02 (4.86)	2.53 (4.07)		
Slip %				8.91	9.14	9.94	10.46	10.98	10.63		

Department of Agricultural Engineering

Dates of Test: September 17 to October 2, 1980

Manufacturer: TOYOSHA COMPANY LTD, 55  
Joshiji-16, Kadoma City, Osaka, Japan

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel  
Cetane No. 47.9 (rating taken from oil company's  
inspection data) Specific gravity converted to  
60°/60° (15°/15°) 0.8378 Fuel weight 6.976 lbs/gal  
(0.836 kg/l) Oil SAE 20-20W API service classi-  
fication SB/SE-CA/CC To motor 1.082 gal  
(4.095 l) Drained from motor 1.059 gal (4.009 l)  
Transmission and final drive lubricant Massey  
Ferguson Permatran fluid Total time engine was  
operated 39.5 hours

**ENGINE:** Make Toyosha Diesel Type two  
cylinder vertical Serial No. S 126 MO 1949  
Crankshaft lengthwise Rated rpm 2500 Bore  
and stroke 3.62" × 3.74" (92 mm × 95 mm) Com-  
pression ratio 23 to 1 Displacement 77.1 cu in  
(1263 ml) Starting system 12 volt Lubrication  
pressure Air cleaner one paper element Oil fil-  
ter one full flow paper cartridge Fuel filter one  
paper cartridge Muffler vertical Cooling  
medium temperature control one thermostat

**CHASSIS:** Type front wheel assist Serial No.  
00553 Tread width rear 41.5" (1055 mm) to 53.3"  
(1355 mm) front 39.6" (1005 mm) Wheel base 59.4"  
(1510 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  
24.4" (620 mm) Vertical distance above roadway  
28.6" (726 mm) Horizontal distance from center of  
rear wheel tread 0" (0 mm) to the right/left Hyd-  
raulic control system direct engine drive Trans-  
mission selective gear fixed ratio Advertised  
speeds mph (km/h) first 0.3 (0.5) second 0.4 (0.6)  
third 0.5 (0.8) fourth 0.8 (1.3) fifth 1.0 (1.6) sixth  
1.4 (2.3) seventh 1.8 (2.9) eighth 2.6 (4.2) ninth 4.0  
(6.4) tenth 5.7 (9.2) eleventh 7.4 (11.9) twelfth  
11.0 (17.7) reverse 0.6 (1.0), 1.9 (3.1), 7.8 (12.6)  
Clutch dry single disc operated by foot pedal  
Brakes drum and shoe operated by two foot ped-  
als which can be locked together Steering me-  
chanical Turning radius (on concrete surface  
with brake applied) right 93.3" (2.37 m) left 93.5"  
(2.37 m) (on concrete surface without brake) right  
105.6" (2.68 m) left 111.4" (2.83 m) Turning space  
diameter (on concrete surface with brake applied)  
right 196.3" (4.98 m) left 196.5" (4.99 m) (on con-  
crete surface without brake) right 221" (5.61 m)  
left 232.5" (5.91 m) Power take-off 540 rpm at  
2326 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. Temperature at injection pump was

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	94.5	94.0
75% of Pull at Maximum Power—Ten Hours		92.5
50% of Pull at Maximum Power—Two Hours		91.0
50% of Pull at Reduced Engine Speed—Two Hours		90.0
Bystander in 12th (H4) gear		78.0

### DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool- ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Available Power—Two Hours 10th (H2) Gear</b>											
17.22 (12.84)	1196 (5.32)	5.40 (8.69)	2499	6.49	1.684 (6.376)	0.682 (0.415)	10.23 (2.014)	176 (79.7)	61 (15.8)	75 (23.9)	28.815 (97.304)

### MAXIMUM POWER IN SELECTED GEARS

16.40 (12.23)	2596 (11.55)	2.37 (3.81)	2601	14.90	8th (M4) Gear			172 (77.5)	42 (5.6)	46 (7.8)	29.260 (98.807)
17.55 (13.09)	1218 (5.42)	5.40 (8.70)	2500	6.51	10th (H2) Gear			176 (80.0)	59 (15.0)	75 (23.9)	28.820 (97.321)

### TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
<b>Rear Tires</b>	—No., size, ply & psi (kPa)	Two 11.2/10-24; 4; 18 (125)	Two 11.2/10-24; 4; 18 (125)
Ballast	—Liquid (each)	280 lb (127 kg)	None
	—Cast Iron (each)	180 lb (82 kg)	None
<b>Front Tires</b>	—No., size, ply & psi (kPa)	Two 6-14; 4; 26 (180)	Two 6-14; 4; 26 (180)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	55 lb (25 kg)	None
<b>Height of Drawbar</b>		14 in (355 mm)	14 in (355 mm)
<b>Static Weight with Operator</b> —Rear		2575 lb (1168 kg)	1655 lb (751 kg)
—Front		1190 lb (540 kg)	1080 lb (490 kg)
—Total		3765 lb (1708 kg)	2735 lb (1241 kg)

142°F (60.8°C). Four 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 **1366**.

LOUIS I. LEVITICUS  
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman  
W. E. SPLINTER  
K. VON BARGEN  
Board of Tractor Test Engineers



**Massey-Ferguson MF210-4 Diesel**

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