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1-1-1980

## Test 1365: Massey-Ferguson MF210 Diesel 12-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1365 — MASSEY-FERGUSON MF210 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)									
21.96 (16.38)	2500	1.650 (6.246)	0.524 (0.319)	13.31 (2.622)	171 (77.1)	59 (15.1)	75 (24.0)	28.750 (97.084)	
Standard Power Take-off Speed (540 rpm)—One Hour									
21.23 (15.83)	2326	1.560 (5.905)	0.513 (0.312)	13.61 (2.681)	171 (77.2)	60 (15.3)	75 (23.9)	28.755 (97.101)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
19.42 (14.48)	2598	1.466 (5.549)	0.527 (0.320)	13.24 (2.609)	168 (75.3)	60 (15.6)	75 (23.9)	..... .....	
0.00 (0.00)	2730	0.499 (1.889)	..... .....	..... .....	159 (70.6)	60 (15.6)	75 (23.9)	..... .....	
9.90 (7.38)	2648	0.925 (3.502)	0.652 (0.397)	10.70 (2.107)	163 (72.8)	60 (15.6)	75 (23.9)	..... .....	
22.01 (16.41)	2500	1.669 (6.318)	0.529 (0.322)	13.19 (2.597)	170 (76.7)	60 (15.6)	75 (23.9)	..... .....	
5.03 (3.75)	2685	0.710 (2.688)	0.985 (0.599)	7.08 (1.395)	160 (70.8)	60 (15.3)	75 (23.6)	..... .....	
14.70 (10.96)	2622	1.165 (4.410)	0.553 (0.336)	12.61 (2.485)	165 (73.9)	60 (15.6)	75 (23.9)	..... .....	
Av Av	11.84 (8.83)	2631	1.072 (4.058)	0.632 (0.384)	11.04 (2.176)	164 (73.3)	60 (15.5)	75 (23.8)	28.780 (97.186)

### DRAWBAR PERFORMANCE

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 10th (H2) Gear											
17.28 (12.89)	1113 (4.95)	5.82 (9.37)	2498	7.14	1.595 (6.037)	0.644 (0.392)	10.84 (2.135)	170 (76.7)	66 (18.6)	82 (27.5)	28.910 (97.625)
75% of Pull at Maximum Power—Ten Hours 10th (H2) Gear											
14.30 (10.66)	877 (3.90)	6.12 (9.84)	2578	5.43	1.358 (5.141)	0.663 (0.403)	10.53 (2.074)	170 (76.4)	71 (21.7)	83 (28.4)	28.734 (97.030)
50% of Pull at Maximum Power—Two Hours 10th (H2) Gear											
9.90 (7.38)	581 (2.59)	6.38 (10.27)	2637	3.55	1.057 (4.002)	0.745 (0.453)	9.36 (1.844)	165 (73.9)	68 (19.7)	76 (24.2)	28.615 (96.629)
50% of Pull at Reduced Engine Speed—Two Hours 11th (H3) Gear											
9.76 (7.28)	574 (2.55)	6.37 (10.26)	2009	3.40	0.860 (3.256)	0.615 (0.374)	11.35 (2.235)	167 (74.7)	70 (21.1)	85 (29.4)	28.575 (96.493)

### MAXIMUM POWER IN SELECTED GEARS

13.53 (10.09)	2159 (9.60)	2.35 (3.78)	2608	14.97	8th (M4) Gear			164 (73.3)	66 (18.9)	68 (20.0)	28.620 (96.645)
17.49 (13.04)	1663 (7.40)	3.94 (6.35)	2502	11.47	9th (H1) Gear			170 (76.4)	64 (17.8)	80 (26.7)	28.930 (97.692)
18.08 (13.48)	1167 (5.19)	5.81 (9.35)	2498	7.39	10th (H2) Gear			169 (76.1)	62 (16.7)	77 (25.0)	28.920 (97.659)
17.92 (13.36)	866 (3.85)	7.76 (12.49)	2499	5.47	11th (H3) Gear			169 (76.1)	64 (17.8)	79 (26.1)	28.920 (97.659)

### LUGGING ABILITY IN 10th (H2) GEAR

Crankshaft Speed rpm		2498	2248	1998	1751	1495	1233
Pull—lbs (kN)		1167 (5.19)	1263 (5.62)	1317 (5.86)	1337 (5.95)	1364 (6.07)	1334 (5.93)
Increase in Pull %		0	8	13	15	17	14
Power—Hp (kW)		18.08 (13.48)	17.48 (13.04)	16.14 (12.04)	14.34 (10.70)	12.45 (9.28)	10.06 (7.50)
Speed—Mph (km/h)		5.81 (9.35)	5.19 (8.35)	4.60 (7.40)	4.02 (6.47)	3.42 (5.51)	2.83 (4.55)
Slip %		7.39	8.07	8.25	8.43	8.70	8.52

Department of Agricultural Engineering

Dates of Test: September 15 to 24, 1980

Manufacturer: TOYOSHA COMPANY LTD, 55  
Joshoji-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 1.003 gal  
(3.796 l) Drained from motor 0.899 gal (3.404 l)  
**Transmission and final drive lubricant** Massey  
Ferguson Permatran fluid **Total time engine was  
operated** 40.0 hours

**ENGINE:** Make Toyosha Diesel **Type** two  
cylinder vertical **Serial No.** S 126 MO 2122  
**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** standard **Serial No.** 01532  
**Tread width** rear 39.2" (995 mm) to 51" (1295 mm)  
front 39.8" (1010 mm) to 52.2" (1325 mm) **Wheel  
base** 60.2" (1530 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 23.0" (584 mm) Vertical distance above  
roadway 27.2" (691 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 0.3 (0.5) sec-  
ond 0.4 (0.6) third 0.6 (1.0) fourth 0.8 (1.3) fifth  
1.0 (1.6) sixth 1.4 (2.3) seventh 1.8 (2.9) eighth 2.7  
(4.3) ninth 4.5 (7.2) tenth 6.4 (10.3) eleventh 8.4  
(13.5) twelfth 12.4 (20.0) reverse 0.6 (1.0), 1.9  
(3.1), 8.8 (14.2) **Clutch** dry single disc operated  
by foot pedal **Brakes** drum and shoe operated by  
two foot pedals which can be locked together  
**Steering** mechanical **Turning radius** (on concrete  
surface with brake applied) right 98.8" (2.51 m)  
left 99.1" (2.52 m) (on concrete surface without  
brake) right 111.4" (2.83 m) left 112.3" (2.85 m)  
**Turning space diameter** (on concrete surface with  
brake applied) right 202.5" (5.14 m) left 203.5"  
(5.17 m) (on concrete surface without brake) right  
228" (5.79 m) left 229.8" (5.84 m) **Power take-off**  
540 rpm at 2326 engine rpm.

**REPAIRS and ADJUSTMENTS:** The battery  
failed following the limber up period and was re-  
placed.

**REMARKS:** All test results were determined  
from observed data obtained in accordance with

TRACTOR SOUND LEVEL WITHOUT CAB		dB(A)
Maximum Available Power—Two Hours		95.0
75% of Pull at Maximum Power—Ten Hours		93.0
50% of Pull at Maximum Power—Two Hours		91.5
50% of Pull at Reduced Engine Speed—Two Hours		91.5
Bystander in 12th (H4) gear		79.0
TIRES, BALLAST AND WEIGHT		
	With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 11.2/10-24; 4; 14 (95)
Ballast	—Liquid (each)	295 lb (133 kg)
	—Cast Iron (each)	198 lb (90 kg)
Front Tires	—No., size, ply & psi (kPa)	Two 5.00-15; 4; 36 (250)
Ballast	—Liquid (each)	None
	—Cast Iron (each)	52 lb (24 kg)
* Height of Drawbar		12.5 in (320 mm)
Static Weight with Operator—Rear	2545 lb (1154 kg)	1560 lb (708 kg)
—Front	1005 lb (456 kg)	900 lb (408 kg)
—Total	3550 lb (1610 kg)	2460 lb (1116 kg)

SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 142°F (61.2°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 **1365**.

LOUIS I. LEVITICUS  
Engineer-in-Charge

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



**Massey-Ferguson MF210 Diesel**

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Institute of Agriculture and Natural Resources  
University of Nebraska—Lincoln  
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