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Test 1367: Massey-Ferguson MF220 Diesel 12-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1367 — MASSEY-FERGUSON MF220 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)									
26.37 (19.66)	2500	2.078 (7.866)	0.550 (0.335)	12.69 (2.499)	175 (79.7)	64 (17.7)	75 (23.8)	28.900 (97.591)	
Standard Power Take-off Speed (540 rpm)—One Hour									
25.52 (19.03)	2327	1.911 (7.234)	0.522 (0.318)	13.36 (2.631)	175 (79.6)	64 (17.8)	75 (23.9)	28.900 (97.591)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
23.22 (17.32)	2589	1.707 (6.462)	0.513 (0.312)	13.60 (2.680)	173 (78.3)	64 (17.8)	75 (23.9)	..... .....
0.00 (0.00)	2713	0.598 (2.264)	..... .....	..... .....	168 (75.6)	64 (17.8)	76 (24.4)	..... .....
11.87 (8.85)	2646	1.088 (4.119)	0.639 (0.389)	10.91 (2.149)	171 (77.2)	64 (17.8)	75 (23.9)	..... .....
26.33 (19.63)	2500	2.073 (7.847)	0.549 (0.334)	12.70 (2.502)	176 (80.0)	64 (17.8)	75 (23.9)	..... .....
6.02 (4.49)	2680	0.856 (3.240)	0.993 (0.604)	7.03 (1.386)	169 (76.1)	64 (17.8)	76 (24.2)	..... .....
17.67 (13.18)	2626	1.363 (5.160)	0.538 (0.327)	12.96 (2.554)	173 (78.3)	64 (17.8)	75 (23.9)	..... .....
Av Av	14.18 (10.57)	2625	1.281 (4.849)	0.630 (0.383)	11.07 (2.180)	172 (77.6)	64 (17.8)	75 (24.1)	28.873 (97.501)

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 9th (H1) Gear											
22.73 (16.95)	1965 (8.74)	4.34 (6.98)	2498	8.30	2.025 (7.665)	0.622 (0.378)	11.22 (2.211)	173 (78.3)	54 (11.9)	64 (17.5)	29.025 (98.013)
75% of Pull at Maximum Power—Ten Hours 9th (H1) Gear											
19.00 (14.17)	1551 (6.90)	4.59 (7.39)	2593	6.36	1.638 (6.200)	0.601 (0.366)	11.60 (2.285)	172 (78.0)	52 (11.3)	65 (18.2)	29.014 (97.976)
50% of Pull at Maximum Power—Two Hours 9th (H1) Gear											
13.12 (9.78)	1035 (4.60)	4.75 (7.65)	2630	4.55	1.290 (4.884)	0.686 (0.417)	10.17 (2.003)	172 (77.5)	54 (12.2)	68 (19.7)	29.010 (97.962)
50% of Pull at Reduced Engine Speed—Two Hours 10th (H2) Gear											
13.09 (9.76)	1032 (4.59)	4.76 (7.65)	1863	4.34	1.003 (3.798)	0.535 (0.325)	13.04 (2.570)	168 (75.6)	54 (11.9)	69 (20.6)	29.010 (97.962)
MAXIMUM POWER IN SELECTED GEARS											
21.48 (16.02)	3287 (14.62)	2.45 (3.94)	2558	14.95	8th (M4) Gear			172 (77.8)	46 (7.8)	55 (12.8)	28.900 (97.591)
23.95 (17.86)	2068 (9.20)	4.34 (6.99)	2500	8.06	9th (H1) Gear			174 (78.6)	53 (11.7)	58 (14.4)	28.970 (97.827)
23.75 (17.71)	1415 (6.29)	6.29 (10.13)	2500	5.60	10th (H2) Gear			173 (78.3)	52 (11.1)	57 (13.9)	28.900 (97.895)
23.39 (17.44)	1051 (4.67)	8.35 (13.44)	2500	4.21	11th (H3) Gear			174 (78.9)	53 (11.7)	58 (14.4)	29.020 (97.996)
LUGGING ABILITY IN 9th (H1) GEAR											
Crankshaft Speed rpm			2500	2254	2003	1752	1493	1247			
Pull—lbs (kN)			2068 (9.20)	2150 (9.56)	2242 (9.97)	2229 (9.91)	2226 (9.90)	2083 (9.27)			
Increase in Pull %			0	4	8	8	8	1			
Power—Hp (kW)			23.95 (17.86)	22.37 (16.68)	20.61 (15.37)	17.91 (13.36)	15.27 (11.38)	12.01 (8.95)			
Speed—Mph (km/h)			4.34 (6.99)	3.90 (6.28)	3.45 (5.55)	3.01 (4.85)	2.57 (4.14)	2.16 (3.48)			
Slip %			8.06	8.59	8.97	9.06	8.87	8.30			

Department of Agricultural Engineering

Dates of Test: September 15 to 26, 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** 0.953 gal
(3.606 l) **Drained from motor** 0.735 gal (2.783 l)
Transmission and final drive lubricant Massey
Ferguson Permatran fluid **Total time engine was**
operated 41.0 hours

ENGINE: Make Toyosha Diesel **Type** two
cylinder vertical **Serial No.** S 148 MO 0199
Crankshaft lengthwise **Rated rpm** 2500 **Bore**
and stroke 3.82" × 3.94" (97 mm × 100 mm) **Com-**
pression ratio 23 to 1 **Displacement** 90.3 cu in
(1480 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.** 00224
Tread width rear 40.9" (1040 mm) to 62.5" (1588
mm) front 40.9" (1040 mm) to 51.2" (1300 mm)
Wheel base 61.6" (1565 mm) **Center of gravity**
(without operator or ballast, with minimum tread,
with fuel tank filled and tractor serviced for oper-
ation) Horizontal distance forward from center-
line of rear wheels 22.6" (574 mm) Vertical distance
above roadway 26.6" (676 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 0.5 (0.8) fourth 0.9 (1.4) fifth
1.0 (1.6) sixth 1.5 (2.4) seventh 1.9 (3.1) eighth 2.8
(4.5) ninth 4.7 (7.6) tenth 6.7 (10.8) eleventh 8.8
(14.2) twelfth 14.0 (22.5) reverse 0.6 (1.0), 2.0
(3.2), 9.2 (14.8) **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 90.3" (2.29 m)
left 91.0" (2.31 m) (on concrete surface without
brake) right 108.6" (2.76 m) left 106.8" (2.71 m)
Turning space diameter (on concrete surface with
brake applied) right 189" (4.80 m) left 190.5" (4.84
m) (on concrete surface without brake) right
225.8" (5.73 m) left 222" (5.64 m) **Power take-off**
540 rpm at 2327 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

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	93.5
75% of Pull at Maximum Power—Ten Hours	93.5
50% of Pull at Maximum Power—Two Hours	92.0
50% of Pull at Reduced Engine Speed—Two Hours	90.0
Bystander in 12th (H4) gear	79.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 12.4-24; 4; 16 (110)	Two 12.4-24; 4; 16 (110)
	—Liquid (each)	380 lb (172 kg)	None
	—Cast Iron (each)	297 lb (135 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 5.00-15; 4; 36 (250)	Two 5.00-15; 4; 36 (250)
	—Liquid (each)	None	None
	—Cast Iron (each)	50 lb (23 kg)	None
Height of Drawbar		14 in (355 mm)	14 in (355 mm)
Static Weight with Operator—Rear		3140 lb (1424 kg)	1785 lb (810 kg)
—Front		1080 lb (490 kg)	980 lb (444 kg)
—Total		4220 lb (1914 kg)	2765 lb (1254 kg)

procedure. Temperature at injection pump was 138°F (59.0°C). Four gears were chosen between 15% slip and 10 mph (16.1 km/h). Both cylinder walls were found to be scratched during final inspection.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1367.

LOUIS I. LEVITICUS
Engineer-in-Charge

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



Massey-Ferguson MF220 Diesel