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## Test 1522: Massey-Ferguson 290 Multipower Diesel 8 and 12-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1522

## MASSEY FERGUSON 290 MULTIPOWER DIESEL

### 12 SPEED ALSO 8 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—664 rpm)								
65.92 (49.16)	2200	4.234 (16.025)	0.450 (0.274)	15.57 (3.068)	187 (86.1)	60 (15.6)	75 (23.8)	28.79 (97.21)
Standard Power Take-off Speed (540 rpm) — One hour								
59.37 (44.27)	1789	3.581 (13.555)	0.422 (0.257)	16.58 (3.266)	187 (86.1)	60 (15.6)	75 (23.9)	28.78 (97.17)

#### VARYING POWER AND FUEL CONSUMPTION—Two Hours

58.12 (43.34)	2282	3.778 (14.302)	0.455 (0.277)	15.38 (3.030)	184 (84.4)	61 (16.1)	77 (25.0)	.....	
0.00 (0.00)	2380	1.285 (4.865)	.....	.....	175 (79.4)	61 (15.8)	76 (24.2)	.....	
29.83 (22.24)	2338	2.468 (9.340)	0.579 (0.352)	12.09 (2.381)	179 (81.7)	60 (15.6)	75 (23.9)	.....	
66.20 (49.37)	2201	4.250 (16.086)	0.450 (0.273)	15.58 (3.069)	187 (86.1)	60 (15.6)	75 (23.9)	.....	
15.03 (11.21)	2361	1.868 (7.070)	0.870 (0.529)	8.05 (1.586)	179 (81.7)	60 (15.3)	75 (23.6)	.....	
44.13 (32.91)	2311	3.084 (11.675)	0.489 (0.298)	14.31 (2.818)	181 (82.8)	60 (15.6)	75 (23.6)	.....	
<b>Av 35.55</b> <b>Av (26.51)</b>	<b>2312</b>	<b>2.789</b> <b>(10.556)</b>	<b>0.549</b> <b>(0.334)</b>	<b>12.75</b> <b>(2.511)</b>	<b>181</b> <b>(82.7)</b>	<b>60</b> <b>(15.6)</b>	<b>75</b> <b>(24.0)</b>	<b>28.79</b> <b>(97.23)</b>	

#### 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 7th (1HL) Gear											
55.32 (41.25)	4260 (18.95)	4.87 (7.84)	2201	6.98	4.177 (15.811)	0.529 (0.322)	13.24 (2.609)	188 (86.4)	52 (10.8)	59 (14.7)	29.32 (99.01)
75% of Pull at Maximum Power—Ten Hours 7th (1HL) Gear											
44.93 (33.50)	3241 (14.42)	5.20 (8.37)	2294	4.78	3.521 (13.330)	0.549 (0.334)	12.76 (2.514)	186 (85.7)	61 (15.9)	65 (18.5)	29.29 (98.90)
50% of Pull at Maximum Power—Two Hours 7th (1HL) Gear											
30.80 (22.97)	2161 (9.61)	5.34 (8.60)	2325	3.37	2.806 (10.622)	0.638 (0.388)	10.98 (2.162)	185 (84.7)	54 (11.9)	63 (16.9)	29.31 (98.96)
50% of Pull at Reduced Engine Speed—Two Hours 9th (2HL) Gear											
30.81 (22.98)	2161 (9.61)	5.35 (8.61)	1584	3.23	2.192 (8.297)	0.498 (0.303)	14.06 (2.769)	184 (84.2)	61 (15.8)	66 (18.9)	29.28 (98.86)

#### MAXIMUM POWER IN SELECTED GEARS

44.35 (33.07)	7654 (34.05)	2.17 (3.50)	2290 (8.30)	14.54	4th (2LH) Gear			186 (85.6)	46 (7.8)	50 (10.0)	29.26 (98.81)	
53.54 (39.92)	6593 (29.33)	3.04 (4.90)	2201 (8.00)	11.61	5th (3LL) Gear			187 (85.8)	47 (8.3)	51 (10.6)	29.27 (98.84)	
55.39 (41.31)	5075 (22.57)	4.09 (6.59)	2200 (8.00)	8.42	6th (3LH) Gear			187 (85.8)	47 (8.3)	52 (11.1)	29.28 (98.87)	
56.10 (41.84)	4321 (19.22)	4.87 (7.84)	2200 (8.00)	6.98	7th (1HL) Gear			187 (86.1)	50 (10.0)	55 (12.8)	29.31 (98.98)	
56.36 (42.03)	3284 (14.61)	6.44 (10.36)	2198 (8.00)	5.38	8th (1HH) Gear			187 (86.1)	48 (8.9)	53 (11.7)	29.29 (98.91)	
55.46 (41.35)	2839 (12.63)	7.33 (11.79)	2201 (8.00)	4.58	9th (2HL) Gear			187 (85.8)	49 (9.4)	54 (12.2)	29.30 (98.94)	
54.81 (40.87)	2134 (9.49)	9.63 (15.50)	2199 (8.00)	3.51	10th (2HH) Gear			187 (85.8)	49 (9.4)	54 (12.2)	29.31 (98.98)	

Department of Agricultural Engineering

Dates of Test: May 11-31, 1984

Manufacturer: MASSEY FERGUSON MANUFACTURING CO., P.O. Box 62 Banner Lane, Coventry CV4 9GF Warwickshire, England

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 46.0 (rating taken from oil company's inspection data) Specific gravity converted to 60°/60° (15°/15°) 0.8410 Fuel weight 7.003 lbs/gal (0.839 kg/l) Oil SAE 15W-40 API service classification SE, SF, CC, CD To motor 1.576 gal (5.967 l) Drained from motor 1.382 gal (5.230 l) Transmission and final drive lubricant Massey Ferguson Permatran III fluid Total time engine was operated 48.5 hours.

**ENGINE:** Make Perkins Diesel Type four cylinder vertical Serial No. LF22790U886774K Crankshaft lengthwise Rated rpm 2200 Bore and stroke 3.975" × 5" (101 mm × 127 mm) Compression ratio 16 to 1 Displacement 248 cu in (4065 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements Oil filter one full flow cartridge Oil cooler radiator for hydraulic and transmission oil Fuel filter one paper element Muffler vertical Cooling medium temperature control one thermostat.

**CHASSIS:** Type standard Serial No. 389979 Tread width rear 56" (1422 mm) to 90" (2286 mm) front 52" (1321 mm) to 72" (1829 mm) Wheel base 84" (2134 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 32.3" (820 mm) Vertical distance above roadway 33.0" (838 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 with partial (2) range operator controlled powershift Advertised speeds mph (km/h) first 1.3 (2.1) second 1.7 (2.7) third 1.9 (3.1) fourth 2.5 (4.0) fifth 3.5 (5.7) sixth 4.6 (7.4) seventh 5.4 (8.6) eighth 7.0 (11.2) ninth 7.9 (12.7) tenth 10.3 (16.5) eleventh 14.4 (23.2) twelfth 18.8 (30.2) reverse 1.8 (2.9), 2.3 (3.7) 7.3 (11.8) 9.5 (15.3) Clutch single dry disc operated by foot pedal Brakes multiple wet disc hydraulically operated by two foot pedals which can be locked together and mechanically by hand lever Steering hydrostatic Turning radius (on concrete surface with brake applied) right 128" (3.25 m) left 124" (3.15 m) (on concrete surface without brake) right 152" (3.86 m) left 148" (3.76 m) Turning space diameter (on concrete surface with brake applied) right 265" (6.73 m) left 257" (6.53 m) (on concrete surface without brake) right 312" (7.92 m) left 303" (7.70 m) Power take-off 540 rpm at 1789 engine rpm.

# LUGGING ABILITY IN 7th (1HL) GEAR

Crankshaft Speed rpm	2200	1986	1751	1541	1314	1097
Pull—lbs (kN)	4321 (19.22)	4603 (20.63)	4855 (21.76)	4932 (22.11)	5102 (22.87)	5033 (22.56)
Increase in Pull %	0	7	12	14	18	16
Power—Hp (kW)	56.10 (41.84)	53.66 (40.02)	49.65 (37.03)	44.31 (33.04)	38.94 (29.04)	32.08 (23.92)
Speed—Mph (km/h)	4.87 (7.84)	4.37 (7.04)	3.84 (6.17)	3.37 (5.42)	2.86 (4.61)	2.39 (3.85)
Slip %	6.98	7.55	8.05	8.05	8.54	8.42

## TRACTOR SOUND LEVEL WITHOUT CAB

	dB(A)
Maximum Available Power—Two Hours	97.5
75% of Pull at Maximum Power—Ten Hours	96.5
50% of Pull at Maximum Power—Two Hours	95.5
50% of Pull at Reduced Engine Speed—Two Hours	93.0
Bystander in 12th (3HH) gear	89.0

## TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
<b>Rear Tires</b>		
—No., size, ply & psi (kPa)	Two 18.4-30; 6; 16 (110)	Two 18.4-30; 6; 16 (110)
—Liquid (each)	905 lb (410 kg)	None
—Cast Iron (each)	610 lb (277 kg)	None
<b>Front Tires</b>		
—No., size, ply & psi (kPa)	Two 7.50-16; 6; 40 (275)	Two 7.50-16; 6; 40 (275)
—Liquid (each)	None	None
—Cast Iron (each)	50 lb (23 kg)	None
<b>Height of Drawbar</b>	16 in (405 mm)	16 in (405 mm)
<b>Static Weight with Operator—Rear</b>	6755 lb (3064 kg)	3725 lb (1690 kg)
—Front	2315 lb (1050 kg)	2215 lb (1005 kg)
—Total	9070 lb (4114 kg)	5940 lb (2695 kg)

**REPAIRS and ADJUSTMENTS:** During the limber up run, the left rear tire developed a fluid leak between the tire bead and rim. A tube was installed and test continued.

**REMARKS:** All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 156°F (68.6°C). Seven 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. 1522, July 3, 1984.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers



Massey Ferguson 290 Multipower Diesel