

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

5-16-1984

Test 1523: Massey-Ferguson 298 Diesel 8-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 1523: Massey-Ferguson 298 Diesel 8-Speed" (1984). *Nebraska Tractor Tests*. 1834.

<https://digitalcommons.unl.edu/tractormuseumlit/1834>

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 1523 — MASSEY FERGUSON 298 DIESEL 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—1182 rpm)									
79.54 (59.32)	2000	5.122 (19.387)	0.451 (0.274)	15.53 (3.060)	185 (85.0)	63 (17.5)	75 (23.9)	28.83 (97.37)	
Standard Power Take-off Speed (1000 rpm) — One hour									
73.66 (54.93)	1692	4.517 (17.095)	0.429 (0.261)	16.31 (3.213)	184 (84.6)	64 (17.7)	75 (23.9)	28.86 (97.44)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
70.67 (52.70)	2091	4.575 (17.318)	0.453 (0.276)	15.45 (3.043)	182 (83.1)	65 (18.1)	76 (24.2)	..... .....
0.00 (0.00)	2219	1.641 (6.211)	..... .....	..... .....	176 (80.0)	64 (17.5)	74 (23.1)	..... .....
36.49 (27.21)	2160	2.943 (11.140)	0.565 (0.344)	12.40 (2.443)	179 (81.7)	64 (17.8)	76 (24.2)	..... .....
80.05 (59.69)	2000	5.162 (19.540)	0.452 (0.275)	15.51 (3.055)	185 (84.7)	63 (17.2)	76 (24.2)	..... .....
21.19 (15.80)	2186	2.356 (8.919)	0.779 (0.474)	8.99 (1.772)	177 (80.6)	62 (16.7)	74 (23.3)	..... .....
53.95 (40.23)	2128	3.684 (13.946)	0.478 (0.291)	14.64 (2.885)	180 (82.2)	63 (17.2)	77 (24.7)	..... .....
Av Av	43.72 (32.61)	2131	3.394 (12.846)	0.544 (0.331)	12.88 (2.538)	180 (82.0)	63 (17.4)	75 (23.9)	28.87 (97.50)

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 5th (1H) Gear											
68.49 (51.07)	4989 (22.19)	5.15 (8.29)	2000	6.77	5.084 (19.243)	0.520 (0.316)	13.47 (2.654)	188 (86.7)	55 (12.5)	64 (17.8)	29.14 (98.38)
75% of Pull at Maximum Power—Ten Hours 5th (1H) Gear											
56.42 (42.07)	3820 (16.99)	5.54 (8.91)	2100	4.50	4.294 (16.254)	0.533 (0.324)	13.14 (2.588)	188 (86.6)	64 (17.6)	75 (23.8)	28.72 (96.99)
50% of Pull at Maximum Power—Two Hours 5th (1H) Gear											
38.91 (29.02)	2547 (11.33)	5.73 (9.22)	2144	3.28	3.370 (12.757)	0.606 (0.369)	11.55 (2.275)	185 (85.0)	58 (14.2)	69 (20.6)	29.10 (98.25)
50% of Pull at Reduced Engine Speed—Two Hours 6th (2H) Gear											
38.91 (29.02)	2546 (11.33)	5.73 (9.22)	1459	2.99	2.613 (9.892)	0.470 (0.286)	14.89 (2.933)	185 (85.0)	60 (15.6)	72 (22.2)	29.03 (98.03)
MAXIMUM POWER IN SELECTED GEARS											
41.72 (31.11)	8712 (38.75)	1.80 (2.89)	2127	14.68	2nd (2L) Gear			183 (83.9)	49 (9.4)	55 (12.8)	29.19 (98.57)
65.54 (48.88)	7672 (34.12)	3.20 (5.16)	1999	11.71	3rd (3L) Gear			185 (85.0)	50 (10.0)	58 (14.4)	29.18 (98.54)
67.64 (50.44)	6250 (27.80)	4.06 (6.53)	2000	8.97	4th (4L) Gear			186 (85.6)	52 (11.1)	60 (15.6)	29.17 (98.50)
69.74 (52.01)	5093 (22.65)	5.14 (8.26)	1998	6.94	5th (1H) Gear			187 (86.1)	53 (11.7)	63 (17.2)	29.16 (98.47)
69.38 (51.73)	3368 (14.98)	7.73 (12.43)	2001	4.74	6th (2H) Gear			187 (85.8)	53 (11.7)	62 (16.7)	29.17 (98.50)
LUGGING ABILITY IN 5th (1H) GEAR											
Crankshaft Speed rpm				1998	1802	1600	1399	1198	997		
Pull—lbs (kN)				5093 (22.65)	5405 (24.23)	5745 (25.75)	5887 (26.39)	5951 (26.67)	5878 (26.35)		
Increase in Pull %				0	6	13	16	17	15		
Power—Hp (kW)				69.74 (52.01)	66.33 (49.46)	62.27 (46.43)	55.64 (41.49)	48.09 (35.86)	39.57 (29.51)		
Speed—Mph (km/h)				5.14 (8.26)	4.60 (7.41)	4.06 (6.54)	3.54 (5.70)	3.03 (4.88)	2.52 (4.06)		
Slip %				6.94	7.47	8.13	8.26	8.39	8.26		

Department of Agricultural Engineering

Dates of Test: May 16 to June 1, 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 2.597 gal (9.831 l) Drained from motor 2.085 gal (7.892 l) Transmission and final drive lubricant Massey Ferguson Permatran III fluid Total time engine was operated 44.0 hours.

ENGINE: Make Perkins Diesel Type four cylinder vertical Serial No. ND31120U529075K Crankshaft lengthwise Rated rpm 2000 Bore and stroke 4.5" x 5" (114.4 mm x 127 mm) Compression ratio 17.5 to 1 Displacement 318 cu in (5212 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements Oil filter one full flow cartridge Oil cooler engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil Fuel filter two paper elements Muffler vertical Cooling medium temperature control one thermostat.

CHASSIS: Type standard Serial No. 703074 Tread width rear 60" (1524 mm) to 96" (2438 mm) front 57" (1448 mm) to 77" (1956 mm) Wheel base 96" (2438 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 32.2" (818 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 Advertised speeds mph (km/h) first 1.4 (2.2) second 2.0 (3.3) third 3.7 (6.0) fourth 4.6 (7.3) fifth 5.7 (9.1) sixth 8.3 (13.3) seventh 15.2 (24.5) eighth 18.7 (30.0) reverse 1.9 (3.0), 7.7 (12.4) 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 160" (4.07 m) left 163" (4.14 m) (on concrete surface without brake) right 192" (4.87 m) left 197" (5.00 m) Turning space diameter (on concrete surface with brake applied) right 328" (8.34 m) left 334" (8.48 m) (on concrete surface without brake) right 392" (9.94 m) left 402" (10.20 m) Power take-off 540 rpm at 1686 engine rpm and 1000 rpm at 1692 engine rpm.

REPAIRS and ADJUSTMENTS: During the preliminary PTO test, the No. 3 injector was found to be leaking. Test continued after the copper sealing washer under the injector cap was replaced.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	100.0
75% of Pull at Maximum Power—Ten Hours	99.0
50% of Pull at Maximum Power—Two Hours	97.5
50% of Pull at Reduced Engine Speed—Two Hours	97.0
Bystander in 7th (3H) gear	90.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (<i>kPa</i>)	Two 18.4-34; 6; 16 (110)	Two 18.4-34; 6; 16 (110)
	Ballast		
	—Liquid (each)	995 lb (451 kg)	None
	—Cast Iron (each)	495 lb (225 kg)	None
Front Tires	—No., size, ply & psi (<i>kPa</i>)	Two 9.5L-15; 6; 32 (220)	Two 9.5L-15; 6; 32 (220)
	Ballast		
	—Liquid (each)	None	None
	—Cast Iron (each)	45 lb (20 kg)	None
Height of Drawbar		22.5 in (570 mm)	22.5 in (570 mm)
Static Weight with Operator—Rear		8335 lb (3781 kg)	5355 lb (2429 kg)
—Front		2705 lb (1227 kg)	2615 lb (1186 kg)
—Total		11040 lb (5008 kg)	7970 lb (3615 kg)

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 155°F (68.5°C). Five 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. **1523**, 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 298 Diesel