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January 1979

## Test 1311: Massey-Ferguson 2745 Diesel 8 and 24-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1311 — MASSEY-FERGUSON 2745 DIESEL 24 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	
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>								
<b>Rated Engine Speed—Two Hours (PTO Speed—1243 rpm)</b>								
143.40 (106.93)	2600	10.275 (38.893)	0.498 (0.303)	13.96 (2.749)	185 (84.7)	62 (16.7)	75 (23.7)	28.647 (96.735)
<b>Standard Power Take-off Speed (1000 rpm)—One Hour</b>								
132.21 (98.59)	2092	8.583 (32.489)	0.452 (0.275)	15.40 (3.035)	185 (85.2)	61 (16.1)	75 (23.9)	28.660 (96.781)
<b>VARYING POWER AND FUEL CONSUMPTION—Two Hours</b>								
127.13 (94.80)	2710	9.530 (36.075)	0.522 (0.317)	13.34 (2.628)	182 (83.6)	61 (16.1)	76 (24.2)	..... .....
0.00 (0.00)	2850	4.118 (15.589)	..... .....	..... .....	173 (78.3)	60 (15.6)	74 (23.3)	..... .....
65.14 (48.57)	2778	6.602 (24.991)	0.705 (0.429)	9.87 (1.944)	178 (81.1)	60 (15.8)	75 (23.9)	..... .....
143.00 (106.64)	2601	10.289 (38.948)	0.501 (0.304)	13.90 (2.738)	185 (85.0)	60 (15.8)	74 (23.6)	..... .....
32.92 (24.55)	2809	5.274 (19.964)	1.114 (0.678)	6.24 (1.230)	176 (80.3)	62 (16.4)	76 (24.2)	..... .....
96.49 (71.95)	2743	7.934 (30.035)	0.572 (0.348)	12.16 (2.396)	181 (82.8)	61 (16.1)	75 (23.9)	..... .....
<b>Av 77.45</b> <b>Av (57.75)</b>	<b>2748</b>	<b>7.291</b> <b>(27.600)</b>	<b>0.655</b> <b>(0.398)</b>	<b>10.62</b> <b>(2.092)</b>	<b>179</b> <b>(81.9)</b>	<b>61</b> <b>(16.0)</b>	<b>75</b> <b>(23.8)</b>	<b>28.667</b> <b>(96.803)</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	
<b>Maximum Available Power—Two Hours 14th (5I) Gear</b>											
122.28 (91.19)	8352 (37.15)	5.49 (8.84)	2600	5.97	10.224 (38.700)	0.582 (0.354)	11.96 (2.356)	186 (85.6)	55 (12.8)	70 (21.1)	28.915 (97.642)
<b>75% of Pull at Maximum Power—Ten Hours 14th (5I) Gear</b>											
100.07 (74.63)	6395 (28.45)	5.87 (9.44)	2723	4.18	8.987 (34.021)	0.625 (0.380)	11.13 (2.194)	184 (84.5)	55 (12.6)	67 (19.6)	28.975 (97.844)
<b>50% of Pull at Maximum Power—Two Hours 14th (5I) Gear</b>											
68.98 (51.44)	4271 (19.00)	6.06 (9.75)	2770	2.85	7.349 (27.818)	0.741 (0.451)	9.39 (1.849)	182 (83.1)	54 (11.9)	64 (17.8)	29.135 (98.385)
<b>50% of Pull at Reduced Engine Speed—Two Hours 17th (6I) Gear</b>											
68.99 (51.45)	4271 (19.00)	6.06 (9.75)	1998	2.77	5.606 (21.220)	0.565 (0.344)	12.31 (2.424)	182 (83.1)	56 (13.1)	72 (21.9)	29.125 (98.351)

## MAXIMUM POWER IN SELECTED GEARS

111.30 (82.99)	15386 (68.44)	2.71 (4.37)	2664	14.98	7th (2H) Gear			183 (83.9)	49 (9.4)	54 (12.2)	29.140 (98.401)
118.22 (88.16)	14126 (62.84)	3.14 (5.05)	2600	11.87	8th (3I) Gear			184 (84.4)	50 (10.0)	55 (12.8)	29.140 (98.401)
114.26 (85.21)	13700 (60.94)	3.13 (5.03)	2599	14.01	9th (4L) Gear			186 (85.6)	55 (12.8)	70 (21.1)	28.940 (97.726)
120.57 (89.91)	11863 (52.77)	3.81 (6.13)	2598	9.27	10th (5L) Gear			187 (86.1)	55 (12.8)	68 (20.0)	28.960 (97.794)
121.28 (90.44)	10829 (48.17)	4.20 (6.76)	2600	7.88	11th (3H) Gear			187 (86.1)	55 (12.8)	68 (20.0)	28.970 (97.827)
124.17 (92.59)	9883 (43.96)	4.71 (7.58)	2599	6.95	12th (4I) Gear			187 (86.1)	55 (12.8)	67 (19.4)	28.980 (97.861)
122.89 (91.64)	8386 (37.30)	5.50 (8.84)	2599	5.71	13th (6L) Gear			187 (86.1)	54 (12.2)	66 (18.9)	28.990 (97.895)
125.17 (93.34)	8519 (37.89)	5.51 (8.87)	2599	5.78	14th (5I) Gear			187 (85.8)	54 (12.2)	67 (19.4)	28.970 (97.827)
122.74 (91.53)	7484 (33.29)	6.15 (9.90)	2598	5.19	15th (4H) Gear			187 (86.1)	56 (13.3)	69 (20.6)	28.950 (97.760)
123.03 (91.74)	6433 (28.61)	7.17 (11.54)	2600	4.28	16th (5H) Gear			187 (86.1)	56 (13.3)	70 (21.1)	28.940 (97.726)
123.37 (92.00)	5944 (26.44)	7.78 (12.53)	2600	4.05	17th (6I) Gear			187 (86.1)	55 (12.8)	70 (21.1)	28.940 (97.726)
122.13 (91.07)	5577 (24.81)	8.21 (13.22)	2599	3.59	18th (7L) Gear			187 (86.1)	55 (12.8)	70 (21.1)	28.940 (97.726)

Department of Agricultural Engineering

Dates of Test: May 7-16, 1979

Manufacturer: MASSEY-FERGUSON INC. 1901  
Bell Avenue, Des Moines, Iowa 50315

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°) 0.8356 Fuel weight 6.957 lbs/gal (0.834 kg/l) Oil SAE 20-20W API service classification SB/SE - CA/CC To motor 5.563 gal (21.056 l) Drained from motor 4.846 gal (18.342 l) Transmission and final drive lubricant MF Permatran Total time engine was operated 38.5 hours**

**ENGINE Make Perkins Diesel Type Eight cylinder vee Serial No. XC22656U514224E Crankshaft lengthwise Rated rpm 2600 Bore and stroke 4.25" × 4.75" (108 mm × 120.7 mm) Compression ratio 16.5 to 1 Displacement 539 cu in (8834 ml) Cranking system 12 volt Lubrication pressure Air cleaner two paper elements with aspirator Oil filter two paper cartridges 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 four thermostats**

**CHASSIS: Type standard with duals Serial No. 9R 004056 Tread width rear 65" (1651 mm) to 129" (3276 mm) front 60" (1524 mm) to 80" (2032 mm) Wheel base 110" (2794 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 39.8" (1011 mm) Vertical distance above roadway 41.4" (1052 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 (3) range operator controlled power shift Advertised speeds mph (km/h) first 1.2 (2.0) second 1.7 (2.8) third 1.7 (2.8) fourth 2.2 (3.6) fifth 2.4 (3.9) sixth 2.5 (4.1) seventh 3.1 (4.9) eighth 3.5 (5.6) ninth 3.6 (5.8) tenth 4.1 (6.7) eleventh 4.5 (7.2) twelfth 5.0 (8.0) thirteenth 5.7 (9.2) fourteenth 5.8 (9.3) fifteenth 6.4 (10.3) sixteenth 7.4 (11.9) seventeenth 8.0 (12.9) eighteenth 8.4 (13.5) nineteenth 10.2 (16.5) twentieth 11.7 (18.8) twenty-first 12.0 (19.2) twenty-second 15.0 (24.1) twenty-third 16.6 (26.8) twenty-fourth 21.3 (34.3) reverse 2.2 (3.6), 3.1 (4.9), 4.5 (7.2), 6.4 (10.3) Clutch dual dry disc operated by foot pedal Brakes single wet disc hydraulically operated by two foot pedals which can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 152" (3.86 m) left 152" (3.86 m) (on concrete surface without brake) right 202" (5.13 m) left 202" (5.13 m) Turning space diameter (on concrete surface with brake applied) right 330" (8.38 m) left 330" (8.38 m) (on concrete surface without brake) right 428" (10.90 m) left 428" (10.90 m) Power take-off 1000 rpm at 2092 engine rpm and 540 rpm at 1992 engine rpm.**

**LUGGING ABILITY IN 14th (5I) GEAR**

Crankshaft Speed rpm	2599	2342	2081	1812	1556	1288
Pull—lbs (kN)	8519 (37.89)	9189 (40.87)	9868 (43.89)	10442 (46.45)	10511 (46.76)	10076 (44.82)
Increase in Pull %	0	8	16	23	23	18
Power—Hp (kW)	125.17 (93.34)	121.00 (90.23)	114.63 (85.48)	105.11 (78.38)	90.71 (67.64)	72.30 (53.91)
Speed—Mph (km/h)	5.51 (8.87)	4.94 (7.95)	4.36 (7.01)	3.77 (6.07)	3.24 (5.21)	2.69 (4.33)
Slip %	5.78	6.30	6.88	7.31	7.45	7.17

**TRACTOR SOUND LEVEL WITH CAB dB(A)**

Maximum Available Power—Two Hours	86.0
75% of Pull at Maximum Power—Ten Hours	87.0
50% of Pull at Maximum Power—Two Hours	85.0
50% of Pull at Reduced Engine Speed—Two Hours	82.0
Bystander in 22nd (7H) gear	96.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
<b>Rear Tires</b>	—No., size, ply & psi (kPa)	Four 18.4-38; 10; 16 (110)	Four 18.4-38; 10; 16 (110)
<b>Ballast</b>	—Liquid (each)	1040 lb (472 kg)	None
	—Cast Iron (each)	None	None
<b>Front Tires</b>	—No., size, ply & psi (kPa)	Two 11.00-16; 8; 40 (275)	Two 11.00-16; 8; 40 (275)
<b>Ballast</b>	—Liquid (each)	None	None
	—Cast Iron (each)	70 lb (32 kg)	None
<b>Height of Drawbar</b>		22.5 in (570 mm)	22.5 in (570 mm)
<b>Static Weight with Operator</b> —Rear		14520 lb (6586 kg)	10360 lb (4699 kg)
	Front	4970 lb (2254 kg)	4830 lb (2191 kg)
	Total	19490 lb (8840 kg)	15190 lb (6890 kg)

**REPAIRS and ADJUSTMENTS:** Two fuel injectors were replaced during preliminary PTO test.

**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 return was 159°F (70.5°C). Twelve gears were chosen between 15% slip and 10 mph (16.1 km/h). During the inspection excessive heat erosion signs were found on the exhaust valve side of piston number 1 and 3.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1311.

LOUIS I. LEVITICUS  
Engineer-in-Charge

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



**Massey-Ferguson 2745 Diesel**

The Agricultural Experiment Station  
Institute of Agriculture and Natural Resources  
University of Nebraska—Lincoln  
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