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January 1979

Test 1310: Massey-Ferguson 2705 Diesel 24-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1310 — MASSEY-FERGUSON 2705 DIESEL 24 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—1196 rpm)								
122.20 (91.12)	2500	8.038 (30.427)	0.458 (0.278)	15.20 (2.995)	188 (86.9)	63 (17.0)	75 (23.8)	28.547 (96.397)
Standard Power Take-off Speed (1000 rpm)—One Hour								
115.85 (86.39)	2091	6.960 (26.346)	0.418 (0.254)	16.65 (3.279)	189 (87.1)	62 (16.7)	75 (23.8)	28.570 (96.477)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
111.41 (83.08)	2681	7.978 (30.198)	0.498 (0.303)	13.97 (2.751)	188 (86.7)	62 (16.9)	76 (24.2)	.....
0.00 (0.00)	2811	3.247 (12.292)	.....	.....	181 (82.8)	62 (16.7)	75 (23.9)	.....
57.05 (42.54)	2752	5.610 (21.237)	0.684 (0.416)	10.17 (2.003)	184 (84.4)	62 (16.9)	76 (24.2)	.....
122.87 (91.63)	2500	8.042 (30.443)	0.455 (0.277)	15.28 (3.010)	189 (87.2)	62 (16.7)	75 (23.9)	.....
28.80 (21.47)	2778	4.446 (16.829)	1.074 (0.653)	6.48 (1.276)	182 (83.6)	62 (16.7)	75 (23.9)	.....
85.01 (63.39)	2725	6.787 (25.693)	0.555 (0.338)	12.52 (2.467)	186 (85.8)	62 (16.7)	75 (23.9)	.....
Av 67.52 (50.35)	2708	6.018 (22.782)	0.620 (0.377)	11.22 (2.210)	185 (85.1)	62 (16.8)	75 (24.0)	28.587 (96.533)

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 14th (5I) Gear											
101.44 (75.64)	7205 (32.05)	5.28 (8.50)	2500	6.52	7.960 (30.130)	0.546 (0.332)	12.74 (2.511)	191 (88.3)	49 (9.4)	60 (15.3)	28.970 (97.827)
75% of Pull at Maximum Power—Ten Hours 14th (5I) Gear											
86.23 (64.31)	5537 (24.63)	5.84 (9.40)	2719	4.84	7.654 (28.974)	0.618 (0.376)	11.27 (2.219)	188 (86.8)	41 (4.9)	42 (5.8)	28.740 (97.051)
50% of Pull at Maximum Power—Two Hours 14th (5I) Gear											
59.07 (44.05)	3672 (16.33)	6.03 (9.71)	2760	3.23	6.396 (24.213)	0.753 (0.458)	9.23 (1.819)	187 (86.1)	37 (2.5)	41 (5.0)	28.980 (97.861)
50% of Pull at Reduced Engine Speed—Two Hours 18th (7L) Gear											
58.75 (43.81)	3658 (16.27)	6.02 (9.69)	1889	3.19	4.528 (17.140)	0.536 (0.326)	12.98 (2.556)	184 (84.4)	41 (4.7)	47 (8.3)	29.000 (97.929)
MAXIMUM POWER IN SELECTED GEARS											
93.65 (69.84)	13085 (58.21)	2.68 (4.32)	2613	14.56	7th (2H) Gear			191 (88.1)	56 (13.3)	59 (15.0)	28.550 (96.409)
95.24 (71.02)	12100 (53.82)	2.95 (4.75)	2498	13.99	8th (3I) Gear			192 (88.6)	50 (10.0)	62 (16.7)	28.960 (97.794)
97.41 (72.64)	11906 (52.96)	3.07 (4.94)	2499	12.64	9th (4L) Gear			191 (88.3)	46 (7.8)	54 (12.2)	28.990 (97.895)
99.29 (74.04)	10127 (45.05)	3.68 (5.92)	2500	9.39	10th (5L) Gear			190 (87.8)	51 (10.6)	53 (11.7)	28.580 (96.510)
100.72 (75.11)	9386 (41.75)	4.02 (6.48)	2500	8.61	11th (3H) Gear			190 (87.8)	52 (11.1)	54 (12.2)	28.570 (96.477)
102.62 (76.52)	8563 (38.09)	4.49 (7.23)	2497	7.88	12th (4I) Gear			191 (88.1)	53 (11.7)	55 (12.8)	28.560 (96.443)
100.25 (74.75)	7116 (31.65)	5.28 (8.50)	2499	6.03	13th (6L) Gear			190 (87.8)	56 (13.3)	58 (14.4)	28.540 (96.375)
104.23 (77.72)	7377 (32.81)	5.30 (8.53)	2501	6.26	14th (5I) Gear			191 (88.3)	56 (13.3)	59 (15.0)	28.540 (96.375)
102.04 (76.09)	6456 (28.72)	5.93 (9.54)	2499	5.35	15th (4H) Gear			191 (88.1)	56 (13.3)	58 (14.4)	28.540 (96.375)
102.78 (76.64)	5580 (24.82)	6.91 (11.12)	2499	4.50	16th (5H) Gear			191 (88.3)	56 (13.3)	58 (14.4)	28.540 (96.375)
103.02 (76.82)	5153 (22.92)	7.50 (12.06)	2499	4.02	17th (6I) Gear			191 (88.3)	56 (13.3)	58 (14.4)	28.540 (96.375)
102.72 (76.60)	4867 (21.65)	7.91 (12.74)	2500	3.79	18th (7L) Gear			191 (88.3)	56 (13.3)	59 (15.0)	28.540 (96.375)
98.27 (73.28)	3787 (16.85)	9.73 (15.66)	2501	2.91	19th (6H) Gear			191 (88.3)	56 (13.3)	59 (15.0)	28.540 (96.375)

Department of Agricultural Engineering

Dates of Test: May 7-14, 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/CD To motor 3.886 gal (14.708 l) Drained from motor 3.224 gal (12.203 l) Transmission and final drive lubricant MF Permatran Total time engine was operated 39.5 hours

ENGINE Make Perkins Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** TU31010N29596F **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.875" × 5.0" (98.4 mm × 127.0 mm) **Compression ratio** 16.0 to 1 **Displacement** 354 cu in (5801 ml) **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow 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** two thermostats.

CHASSIS: Type standard **Serial No.** 9R 004209 **Tread width** rear 65" (1651 mm) to 95" (2413 mm) front 60" (1524 mm) to 80" (2032 mm) **Wheel base** 105.4" (2677 mm) **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 34.2" (869 mm) Vertical distance above roadway 43.3" (1100 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 (1.9) second 1.7 (2.7) third 1.7 (2.7) fourth 2.2 (3.5) fifth 2.3 (3.7) sixth 2.4 (3.9) seventh 3.0 (4.8) eighth 3.4 (5.5) ninth 3.5 (5.6) tenth 4.0 (6.5) eleventh 4.4 (7.0) twelfth 4.9 (7.8) thirteenth 5.6 (9.0) fourteenth 5.6 (9.0) fifteenth 6.2 (10.0) sixteenth 7.2 (11.6) seventeenth 7.8 (12.5) eighteenth 8.2 (13.1) nineteenth 9.9 (16.0) twentieth 11.4 (18.3) twenty-first 11.6 (18.7) twenty-second 14.6 (23.4) twenty-third 16.2 (26.0) twenty-fourth 20.7 (33.4) reverse 2.2 (3.5), 3.0 (4.8), 4.4 (7.0), 6.2 (10.0) **Clutch** single 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 135" (3.44 m) left 135" (3.44 m) (on concrete surface without brake) right 180" (4.57 m) left 180" (4.57 m) **Turning space diameter** (on concrete surface with brake applied) right 294" (7.46 m) left 294" (7.46 m) (on concrete surface without brake) right 381" (9.68 m) left 381" (9.68 m) **Power take-off** 1000 rpm at 2091 engine rpm and 540 rpm at 1992 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

LUGGING ABILITY IN 14th (5I) GEAR

Crankshaft Speed rpm	2501	2251	2000	1746	1493	1244
Pull—lbs (kN)	7377 (32.81)	7842 (34.88)	8390 (37.32)	9165 (40.77)	9111 (40.53)	8820 (39.23)
Increase in Pull %	0	6	14	24	24	20
Power—Hp (kW)	104.23 (77.72)	99.28 (74.03)	93.80 (69.94)	88.79 (66.21)	75.40 (56.22)	60.99 (45.48)
Speed—Mph (km/h)	5.30 (8.53)	4.75 (7.64)	4.19 (6.75)	3.63 (5.85)	3.10 (4.99)	2.59 (4.17)
Slip %	6.26	6.71	7.15	7.88	7.88	7.59

TRACTOR SOUND LEVEL WITH CAB dB(A)

Maximum Available Power—Two Hours	81.5
75% of Pull at Maximum Power—Ten Hours	83.5
50% of Pull at Maximum Power—Two Hours	83.0
50% of Pull at Reduced Engine Speed—Two Hours	83.0
Bystander in 23rd (8I) gear	88.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 20.8-38; 10; 22 (150)	Two 20.8-38; 10; 22 (150)
Ballast	—Liquid (each)	1448 lb (656 kg)	None
	—Cast Iron (each)	1000 lb (454 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 11.00-16; 6; 32 (220)	Two 11.00-16; 6; 32 (220)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	None	None
Height of Drawbar		22.5 in (570 mm)	22.5 in (570 mm)
Static Weight with Operator	Rear	13570 lb (6155 kg)	8675 lb (3935 kg)
	Front	3920 lb (1778 kg)	3920 lb (1778 kg)
	Total	17490 lb (7933 kg)	12595 lb (5713 kg)

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 was 143°F (61.7°C). Thirteen 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 **1310**.

LOUIS I. LEVITICUS
Engineer-in-Charge

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



Massey-Ferguson 2705 Diesel

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