8-31-1979

Test 1322: Massey-Ferguson 2705 Diesel 8-Speed

Nebraska Tractor Test Lab
University of Nebraska-Lincoln, tractortestlab@unl.edu

NEBRASKA TRACTOR TEST 1322 — MASSEY-FERGUSON 2705 DIESEL 8 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1196 rpm)								
121.11 (90.31)	2500	7.969 (30.164)	0.461 (0.280)	15.20 (2.994)	189 (87.4)	68 (20.0)	75 (23.9)	28.843 (97.400)
Standard Power Take-off Speed (1000 rpm)—One Hour								
114.44 (85.34)	2091	6.797 (25.730)	0.416 (0.253)	16.84 (3.317)	190 (87.7)	68 (20.0)	75 (23.8)	28.845 (97.405)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
110.84 (82.65)	2689	8.019 (30.354)	0.506 (0.308)	13.82 (2.723)	189 (87.2)	68 (20.3)	75 (23.9)	....
0.00 (0.00)	2815	3.176 (12.021)	....	....	181 (82.8)	68 (20.0)	75 (23.9)	....
56.80 (42.36)	2756	5.623 (21.285)	0.693 (0.422)	10.10 (1.990)	185 (85.0)	68 (20.3)	76 (24.2)	....
121.88 (90.88)	2500	7.963 (30.143)	0.457 (0.278)	15.31 (3.015)	190 (87.5)	69 (20.6)	75 (23.9)	....
28.54 (21.28)	2786	4.329 (16.385)	1.062 (0.646)	6.59 (1.299)	182 (83.6)	69 (20.6)	75 (23.9)	....
84.07 (62.69)	2724	6.720 (25.438)	0.560 (0.340)	12.51 (2.465)	186 (85.8)	70 (20.8)	77 (25.0)	....
Av 67.02	**2712**	**5.971**	**0.624**	**11.22**	**186**	**69**	**75**	**28.847**
Av (49.98)		***(22.604)***	***(0.379)***	***(2.211)***	***(85.3)***	***(20.4)***	***(24.1)***	***(97.411)***

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 4th Gear											
98.51 (73.46)	6979 (31.04)	5.29 (8.52)	2500	7.14	7.857 (29.743)	0.558 (0.340)	12.54 (2.470)	193 (89.4)	83 (28.1)	89 (31.7)	28.815 (97.304)
75% of Pull at Maximum Power—Ten Hours 4th Gear											
83.29 (62.11)	5366 (23.87)	5.82 (9.37)	2695	5.23	7.371 (27.904)	0.619 (0.377)	11.30 (2.226)	189 (87.1)	75 (23.8)	89 (31.8)	28.771 (97.155)
50% of Pull at Maximum Power—Two Hours 4th Gear											
58.19 (43.39)	3620 (16.10)	6.03 (9.70)	2740	3.63	6.161 (23.321)	0.741 (0.451)	9.45 (1.861)	188 (86.4)	82 (27.8)	91 (32.5)	28.770 (97.152)
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
58.30 (43.48)	3632 (16.16)	6.02 (9.69)	1714	3.79	4.304 (16.291)	0.517 (0.314)	13.55 (2.669)	184 (84.4)	68 (19.7)	69 (20.3)	28.970 (97.827)
MAXIMUM POWER IN SELECTED GEARS											
84.07 (62.69)	12588 (55.99)	2.50 (4.03)	2691	14.89	2nd Gear			187 (85.8)	70 (21.1)	74 (23.3)	28.800 (97.253)
97.98 (73.06)	10366 (46.11)	3.54 (5.70)	2499	11.71	3rd Gear			192 (88.6)	74 (23.3)	83 (28.3)	28.830 (97.355)
101.05 (75.36)	7155 (31.83)	5.30 (8.52)	2499	7.03	4th Gear			191 (88.1)	72 (22.2)	79 (26.1)	28.840 (97.382)
101.47 (75.67)	6162 (27.41)	6.17 (9.94)	2500	6.20	5th Gear			192 (88.6)	74 (23.3)	83 (28.3)	28.820 (97.321)
98.41 (73.38)	4229 (18.81)	8.73 (14.04)	2499	4.34	6th Gear			191 (88.1)	75 (23.9)	85 (29.4)	28.820 (97.321)

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2499	2253	1996	1744	1492	1247
Pull—lbs (kN)	7155 (31.83)	7760 (34.52)	8541 (37.99)	8813 (39.20)	8820 (39.24)	8496 (37.79)
Increase in Pull %	0	8	19	23	23	19
Power—Hp (kW)	101.05 (75.36)	98.17 (73.20)	94.80 (70.69)	85.16 (63.50)	72.83 (54.31)	58.82 (43.86)
Speed—Mph (km/h)	5.30 (8.52)	4.74 (7.63)	4.16 (6.70)	3.62 (5.83)	3.10 (4.98)	2.60 (4.18)
Slip %	7.03	7.62	8.50	8.93	9.07	8.64

Department of Agricultural Engineering

Dates of Test: August 31 to September 6, 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°)*** 0.8407 **Fuel weight** 7.000 lbs/gal *(0.838 kg/l)* **Oil SAE** 20-20W **API service classification** SB/SE-CA/CD **To motor** 4.199 gal *(15.895 l)* **Drained from motor** 3.565 gal *(13.495 l)* **Transmission and final drive lubricant** MF Permatran **Total time engine was operated** 33.0 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 **Advertised speeds mph *(km/h)*** first 2.0 *(3.2)* second 2.7 *(4.3)* third 3.9 *(6.3)* fourth 5.6 *(9.0)* fifth 6.5 *(10.5)* sixth 9.0 *(14.5)* seventh 13.1 *(21.1)* eighth 18.7 *(30.1)* reverse 1.7 *(2.7)*, 2.3 *(3.7)*, 3.3 *(5.3)*, 4.8 *(7.7)*, 5.5 *(8.9)*, 7.7 *(12.4)* **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: The tube in the left rear tire was replaced at end of the 50% Drawbar Fuel Test.

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	80.5
75% of Pull at Maximum Power—Ten Hours	80.0
50% of Pull at Maximum Power—Two Hours	80.0
50% of Pull at Reduced Engine Speed—Two Hours	79.0
Bystander in 7th gear	89.0

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)	1148 lb *(521 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		12970 lb *(5883 kg)*	8675 lb *(3935 kg)*
—Front		3830 lb *(1737 kg)*	3830 lb *(1737 kg)*
—Total		16800 lb *(7620 kg)*	12505 lb *(5672 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 151°F *(66.2°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 **1322.**

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

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
H. W. Ottoson, Director