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January 1978

Test 1292: Fiat 580 DT Diesel 12 and 16-Speeds

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1292 — FIAT 580 DT DIESEL
ALSO HESSTON 580 DT FIAT DIESEL
ALSO HESSTON 580 FIAT DIESEL
16 SPEED ALSO 12 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—630 rpm)								
51.61 (38.49)	2700	3.711 (14.047)	0.498 (0.303)	13.91 (2.740)	190 (87.9)	61 (16.3)	74 (23.5)	29.147 (98.424)
Standard Power Take-off Speed (540 rpm)—One Hour								
48.42 (36.11)	2315	3.244 (12.281)	0.464 (0.282)	14.93 (2.940)	187 (86.2)	64 (17.7)	75 (24.0)	29.125 (98.351)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
45.37 (33.83)	2797	2.916 (11.040)	0.445 (0.271)	15.56 (3.064)	181 (82.8)	66 (19.2)	76 (24.7)	..... .....
0.00 (0.00)	2870	0.988 (3.740)	..... .....	..... .....	170 (76.9)	66 (18.6)	76 (24.2)	..... .....
23.04 (17.18)	2833	1.837 (6.955)	0.552 (0.336)	12.54 (2.470)	172 (77.5)	66 (18.6)	75 (23.9)	..... .....
51.68 (38.54)	2700	3.731 (14.124)	0.500 (0.304)	13.85 (2.729)	190 (87.8)	65 (18.3)	75 (23.9)	..... .....
11.63 (8.67)	2866	1.395 (5.282)	0.830 (0.505)	8.34 (1.642)	170 (76.4)	65 (18.3)	75 (23.9)	..... .....
34.29 (25.57)	2816	2.318 (8.776)	0.468 (0.285)	14.79 (2.914)	178 (81.4)	66 (18.9)	75 (23.9)	..... .....
Av Av	27.67 (20.63)	2813	2.198 (8.319)	0.550 (0.334)	12.59 (2.480)	177 (80.5)	75 (24.1)	29.063 (98.140)

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)											
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 11th (3N) Gear											
41.30 (30.80)	3669 (16.32)	4.22 (6.79)	2700	4.22	3.431 (12.986)	0.575 (0.350)	12.04 (2.372)	188 (86.4)	65 (18.1)	80 (26.7)	28.625 (96.662)
75% of Pull at Maximum Power—Two Hours 11th (3N) Gear											
34.03 (25.38)	2907 (12.93)	4.39 (7.07)	2776	3.15	2.708 (10.252)	0.551 (0.335)	12.57 (2.475)	173 (78.3)	39 (3.6)	44 (6.7)	28.865 (97.473)
50% of Pull at Maximum Power—Two Hours 11th (3N) Gear											
22.90 (17.07)	1917 (8.53)	4.48 (7.21)	2811	2.44	2.167 (8.202)	0.655 (0.398)	10.57 (2.082)	172 (77.8)	43 (5.8)	47 (8.3)	28.720 (96.982)
50% of Pull at Reduced Engine Speed—Two Hours 13th (1H) Gear											
23.29 (17.37)	1942 (8.64)	4.50 (7.24)	1600	2.37	1.625 (6.151)	0.483 (0.294)	14.33 (2.823)	171 (77.2)	42 (5.6)	49 (9.2)	28.740 (97.051)
MAXIMUM POWER IN SELECTED GEARS											
39.26 (29.28)	6434 (28.62)	2.29 (3.68)	2707	14.72	9th (1N) Gear			175 (79.4)	42 (5.6)	50 (10.0)	28.800 (97.253)
42.80 (31.92)	4874 (21.68)	3.29 (5.30)	2700	5.90	10th (2N) Gear			185 (84.7)	58 (14.4)	72 (22.2)	28.640 (96.713)
43.47 (32.41)	3866 (17.20)	4.22 (6.79)	2697	4.28	11th (3N) Gear			185 (85.0)	58 (14.4)	72 (22.2)	28.640 (96.713)
41.74 (31.13)	2934 (13.05)	5.34 (8.59)	2699	3.29	12th (4N) Gear			187 (85.8)	60 (15.6)	75 (23.9)	28.650 (96.747)
42.00 (31.32)	2076 (9.23)	7.59 (12.21)	2700	2.27	13th (1H) Gear			186 (85.3)	61 (16.1)	76 (24.4)	28.650 (96.747)
39.42 (29.39)	1474 (6.56)	10.03 (16.14)	2701	1.72	14th (2H) Gear			186 (85.3)	62 (16.7)	78 (25.6)	28.650 (96.747)

LUGGING ABILITY IN 11th (3N) GEAR							
Crankshaft Speed rpm		2697	2434	2156	1886	1621	1353
Pull—lbs (kN)		3866 (17.20)	4247 (18.89)	4439 (19.75)	4839 (21.53)	5037 (22.41)	5148 (22.90)
Increase in Pull %		0	10	15	25	30	33
Power—Hp (kW)		43.47 (32.11)	42.85 (31.95)	39.56 (29.50)	37.44 (27.92)	33.38 (24.89)	28.37 (21.16)
Speed—Mph (km/h)		4.22 (6.79)	3.78 (6.09)	3.34 (5.38)	2.90 (4.67)	2.48 (4.00)	2.07 (3.33)
Slip %		4.28	4.87	5.13	5.65	6.03	6.41

Department of Agricultural Engineering

Dates of Test: October 17-26, 1978

Manufacturer: FIAT TRATTORI S.P.A., Via Pico della Mirandola, 72-41100, Modena, Italy

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 50.4 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°60° (15°/15°) 0.8315 Fuel weight 6.923 lbs/gal (0.832 kg/l) Oil SAE 20W-40 API service classification MIL-L-2104 B EP To motor 1.600 gal (6.056 l) Drained from motor 1.486 gal (5.626 l) Transmission lubricant SAE 20W-40 Final drive lubricant API 303 Total time engine was operated 64.5 hours.

ENGINE: Make Fiat Diesel Type 3 cylinder vertical Serial No. *377-736843* Crankshaft lengthwise Rated rpm 2700 Bore and stroke 4.055" x 4.33" (103 mm x 110 mm) Compression ratio 17.0 to 1 Displacement 168 cu in (2750 ml) Cranking System 12 volt Lubrication pressure Air cleaner oil bath with centrifugal precleaner Oil filter one full flow paper cartridge Fuel filter two paper elements Muffler vertical Cooling medium temperature control thermostat.

CHASSIS: Type Four-wheel drive Serial No. *015383* Tread width rear 63.8" (1620 mm) to 76.4" (1940 mm) front 59.1" (1500 mm) to 78.7" (2000 mm) Wheel base 85.0" (2160 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 31.8" (809 mm) Vertical distance above roadway 34.2" (869 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 0.3 (0.5) second 0.4 (0.6) third 0.5 (0.8) fourth 0.6 (1.0) fifth 0.9 (1.4) sixth 1.2 (1.9) seventh 1.5 (2.4) eighth 1.9 (3.0) ninth 2.6 (4.2) tenth 3.5 (5.6) eleventh 4.4 (7.0) twelfth 5.4 (8.8) thirteenth 7.7 (12.4) fourteenth 10.1 (16.2) fifteenth 12.7 (20.4) sixteenth 15.9 (25.6) reverse 0.3 (0.5), 0.9 (1.4), 2.5 (4.1), 7.4 (11.9) Clutch double 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 167" (4.25 m) left 165" (4.20 m) (on concrete surface without brake) right 199" (5.05 m) left 197" (5.00 m) Turning space diameter (on concrete surface with brake applied) right 345" (8.78 m) left 342" (8.68 m) (on concrete surface without brake) right 409" (10.38 m) left 404" (10.28 m) Power take-off 540 rpm at 2315 engine rpm.

REPAIRS and ADJUSTMENTS: During preliminary drawbar tests both rear tires slipped on their rims with 14 psi pressure. Tire pressure was increased to 18 psi and tests were rerun.

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

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 11th (3N) Gear											
42.08 (31.38)	3679 (16.36)	4.29 (6.90)	2700	2.83	3.467 (13.123)	0.570 (0.347)	12.14 (2.391)	190 (87.5)	65 (18.1)	83 (28.1)	28.615 (96.629)
75% of Pull at Maximum Power—Ten Hours 11th (3N) Gear											
34.25 (25.54)	2895 (12.88)	4.44 (7.14)	2781	2.36	2.698 (10.211)	0.545 (0.332)	12.70 (2.501)	173 (78.2)	40 (4.3)	45 (7.4)	29.349 (99.107)
50% of Pull at Maximum Power—Two Hours 11th (3N) Gear											
23.14 (17.25)	1920 (8.54)	4.52 (7.27)	2814	1.76	2.203 (8.339)	0.659 (0.401)	10.50 (2.069)	173 (78.1)	46 (7.5)	50 (10.0)	28.585 (96.527)
50% of Pull at Reduced Engine Speed—Two Hours 13th (1H) Gear											
23.42 (17.46)	1934 (8.60)	4.54 (7.31)	1604	1.76	1.643 (6.220)	0.486 (0.295)	14.25 (2.807)	171 (77.2)	44 (6.7)	48 (8.9)	28.660 (96.781)

MAXIMUM POWER IN SELECTED GEARS

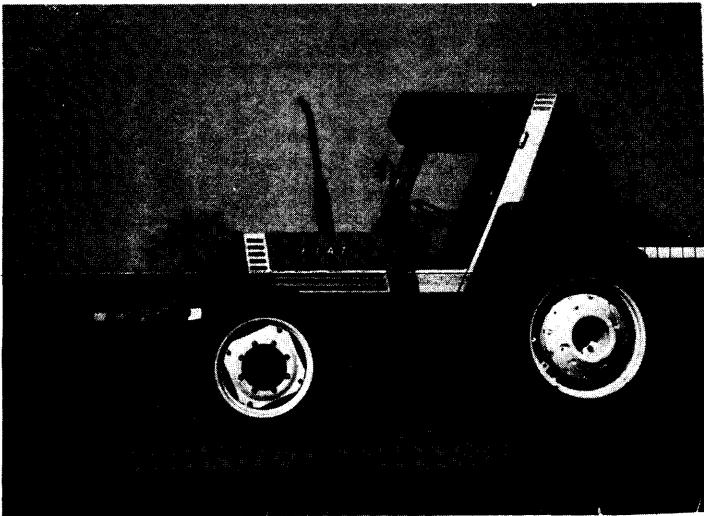
38.41 (28.64)	8899 (39.59)	1.62 (2.60)	2703	14.69	8th (4L) Gear			176 (79.7)	42 (5.6)	50 (10.0)	28.800 (97.253)
43.43 (32.39)	6452 (28.70)	2.52 (4.06)	2700	5.47	9th (1N) Gear			188 (86.4)	62 (16.7)	79 (26.1)	28.640 (96.713)
44.20 (32.96)	4910 (21.84)	3.38 (5.43)	2699	3.70	10th (2N) Gear			184 (84.4)	55 (12.8)	65 (18.3)	28.650 (96.747)
43.98 (32.79)	3851 (17.13)	4.28 (6.89)	2698	2.90	11th (3N) Gear			183 (83.9)	52 (11.1)	60 (15.6)	28.640 (96.713)
42.35 (31.58)	2941 (13.08)	5.40 (8.69)	2700	2.21	12th (4N) Gear			186 (85.3)	60 (15.6)	75 (23.9)	28.650 (96.747)
42.19 (31.46)	2066 (9.19)	7.66 (12.33)	2701	1.73	13th (1H) Gear			185 (85.0)	62 (16.7)	80 (26.7)	28.650 (96.747)
39.22 (29.25)	1457 (6.48)	10.09 (16.25)	2699	1.10	14th (2H) Gear			187 (86.1)	61 (16.1)	77 (25.0)	28.650 (96.747)

LUGGING ABILITY IN 11th (3N) GEAR

Crankshaft Speed rpm	2698	2429	2157	1895	1625	1349	1075
Pull—lbs (kN)	3851 (17.13)	4255 (18.93)	4483 (19.94)	4852 (21.58)	5037 (22.41)	5134 (22.84)	5110 (22.73)
Increase in Pull %	0	10	16	26	31	33	33
Power—Hp (kW)	43.98 (32.79)	43.61 (32.52)	40.74 (30.38)	38.63 (28.81)	34.32 (25.59)	29.02 (21.64)	23.01 (17.16)
Speed—Mph (km/h)	4.28 (6.89)	3.84 (6.19)	3.41 (5.48)	2.99 (4.80)	2.56 (4.11)	2.12 (3.41)	1.69 (2.72)
Slip %	2.90	3.17	3.44	3.70	3.97	3.97	3.70

TRACTOR SOUND LEVEL WITH CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	84.5	85.0
75% of Pull at Maximum Power—Ten Hours	84.5	84.5
50% of Pull at Maximum Power—Two Hours	84.5	84.0
50% of Pull at Reduced Engine Speed—Two Hours	80.5	80.0
Bystander in 16th (4H) gear	—	92.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires Ballast	—No., size, ply & psi (kPa)	Two 16.9R 30; 6; 18 (125)	Two 16.9R 30; 6; 18 (125)
	—Liquid (each)	None	None
	—Cast Iron (each)	678 lb (308 kg)	None
Front Tires Ballast	—No., size, ply & psi (kPa)	Two 11.2R24; 8; 18 (125)	Two 11.2R24; 8; 18 (125)
	—Liquid (each)	None	None
	—Cast Iron (each)	612 lb (278 kg)	None
Height of Drawbar		17 in (430 mm)	17 in (430 mm)
Static Weight with Operator—	Rear	5320 lb (2413 kg)	3965 lb (1798 kg)
	—Front	3890 lb (1765 kg)	2665 lb (1209 kg)
	—Total	9210 lb (4178 kg)	6630 lb (3007 kg)



Fiat 580 DT Diesel

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

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 152°F (66.8°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 1292.

L. I. LEVITICUS
Engineer-in-Charge

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