

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1981

Test 1409: Hesston Fiat 1380 DT Diesel

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 1409: Hesston Fiat 1380 DT Diesel" (1981). *Nebraska Tractor Tests*. 1725.

<https://digitalcommons.unl.edu/tractormuseumlit/1725>

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 1409 — HESSTON 1380 DT FIAT DIESEL ALSO HESSTON 1380 FIAT DIESEL ALSO HESSTON 1380 DT TURBO FIAT DIESEL AND HESSTON 1380 TURBO FIAT DIESEL 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—1034 rpm)									
123.16 (91.84)	2400	7.621 (28.849)	0.427 (0.260)	16.16 (3.183)	193 (89.4)	55 (12.7)	75 (23.9)	29.087 (98.221)	
Standard Power Take-off Speed (1000 rpm)—One Hour									
123.54 (92.12)	2320	7.493 (28.364)	0.418 (0.254)	16.49 (3.248)	193 (89.5)	55 (12.8)	75 (23.9)	29.060 (98.131)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
106.91 (79.72)	2451	6.812 (25.786)	0.439 (0.267)	15.70 (3.092)	191 (88.3)	56 (13.1)	75 (23.9)	..... .....
0.00 (0.00)	2594	2.162 (8.184)	..... .....	..... .....	183 (83.9)	55 (12.8)	74 (23.3)	..... .....
55.20 (41.16)	2526	4.385 (16.599)	0.548 (0.333)	12.59 (2.480)	185 (85.0)	55 (12.8)	74 (23.3)	..... .....
123.77 (92.30)	2400	7.621 (28.849)	0.425 (0.258)	16.24 (3.199)	193 (89.2)	55 (12.8)	74 (23.3)	..... .....
27.76 (20.70)	2552	3.193 (12.087)	0.793 (0.483)	8.70 (1.713)	183 (83.9)	55 (12.8)	74 (23.3)	..... .....
81.50 (60.77)	2488	5.528 (20.926)	0.468 (0.285)	14.74 (2.904)	190 (87.8)	55 (12.8)	75 (23.6)	..... .....
Av Av	65.86 (49.11)	2502	4.950 (18.738)	0.518 (0.315)	13.30 (2.621)	187 (86.3)	55 (12.8)	74 (23.5)	29.003 (97.940)

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 7th (M3) Gear											
101.54 (75.72)	7666 (34.10)	4.97 (7.99)	2400	6.53	7.467 (28.266)	0.507 (0.309)	13.60 (2.679)	187 (86.1)	51 (10.6)	63 (17.2)	29.200 (98.604)
75% of Pull at Maximum Power—Ten Hours 7th (M3) Gear											
82.20 (61.30)	5886 (26.18)	5.24 (8.43)	2480	4.59	6.318 (23.916)	0.530 (0.322)	13.01 (2.563)	183 (83.9)	47 (8.5)	57 (13.7)	29.078 (98.192)
50% of Pull at Maximum Power—Two Hours 7th (M3) Gear											
56.45 (42.10)	3929 (17.48)	5.39 (8.67)	2515	3.21	4.857 (18.386)	0.593 (0.361)	11.62 (2.290)	179 (81.7)	48 (8.6)	57 (13.9)	28.870 (97.490)
50% of Pull at Reduced Engine Speed—Two Hours 9th (H1) Gear											
56.51 (42.14)	3929 (17.48)	5.39 (8.68)	1594	3.13	3.734 (14.133)	0.456 (0.277)	15.14 (2.982)	181 (82.5)	50 (10.0)	62 (16.7)	28.815 (97.304)
MAXIMUM POWER IN SELECTED GEARS											
85.48 (63.74)	13105 (58.29)	2.45 (3.94)	2459	14.86	4th (L4) Gear			179 (81.4)	41 (5.0)	44 (6.7)	28.880 (97.523)
98.96 (73.80)	12100 (53.82)	3.07 (4.94)	2398	12.02	5th (M1) Gear			185 (84.7)	44 (6.7)	50 (10.0)	28.900 (97.591)
103.62 (77.27)	9634 (42.85)	4.03 (6.49)	2400	8.12	6th (M2) Gear			187 (86.1)	50 (10.0)	58 (14.4)	29.260 (98.807)
104.14 (77.66)	7843 (34.89)	4.98 (8.01)	2399	6.18	7th (M3) Gear			186 (85.6)	47 (8.3)	53 (11.7)	29.240 (98.739)
104.44 (77.88)	6433 (28.61)	6.09 (9.80)	2400	4.95	8th (M4) Gear			187 (86.1)	50 (10.0)	59 (15.0)	29.250 (98.773)
104.97 (78.27)	4873 (21.68)	8.08 (13.00)	2400	3.69	9th (H1) Gear			187 (85.8)	51 (10.6)	61 (16.1)	29.230 (98.705)

Department of Agricultural Engineering

Dates of Test: September 30 to October 9, 1981

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8283 **Fuel weight** 6.897 lbs/gal (0.827 kg/l) **Oil SAE 30 API service classification** SE-SF/CC-CD **To motor** 3.431 gal (12.986 l) **Drained from motor** 3.158 gal (11.954 l) **Transmission lubricant** SAE 20W-40 **Final drive lubricant** API 303 **Total time engine was operated** 41.5 hours.

ENGINE: Make Fiat Diesel Type six cylinder vertical with turbocharger **Serial No.** 8065.24*000-206434* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.055" × 4.33" (103 mm × 110 mm) **Compression ratio** 16.5 to 1 **Displacement** 335 cu in (5499 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** two paper cartridges with sediment bowl **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist with duals **Serial No.** 1380 DT/12*735909* **Tread width** rear 64.6" (1640 mm) to 118.5" (3010 mm) front 70.9" (1800 mm) to 88.0" (2235 mm) **Wheel base** 105.2" (2672 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 34.6" (880 mm) Vertical distance above roadway 42.5" (1080 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 1.5 (2.4) second 1.9 (3.1) third 2.3 (3.7) fourth 2.8 (4.5) fifth 3.4 (5.6) sixth 4.4 (7.0) seventh 5.3 (8.5) eighth 6.3 (10.2) ninth 8.3 (13.4) tenth 10.5 (16.8) eleventh 12.6 (20.4) twelfth 15.3 (24.6) reverse 3.5 (5.7), 4.4 (7.1), 5.4 (8.6), 6.5 (10.4) **Clutch** single dry disc operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 202" (5.14 m) left 204" (5.18 m) (on concrete surface without brake) right 241" (6.13 m) left 241" (6.13 m) **Turning space diameter** (on concrete surface with brake applied) right 419" (10.66 m) left 423" (10.74 m) (on concrete surface without brake) right 497" (12.62 m) left 497" (12.62 m) **Power take-off** 1000 rpm at 2320 engine rpm and 540 rpm at 2095 engine rpm.

LUGGING ABILITY IN 7th (M3) GEAR

Crankshaft Speed rpm	2399	2162	1917	1686	1441	1195
Pull—lbs (kN)	7843 (34.89)	8631 (38.39)	9099 (40.47)	9405 (41.84)	9387 (41.76)	8821 (39.24)
Increase in Pull %	0	10	16	20	20	12
Power—Hp (kW)	104.14 (77.66)	102.40 (76.36)	95.19 (70.98)	86.17 (64.26)	73.50 (54.81)	57.64 (42.98)
Speed—Mph (km/h)	4.98 (8.01)	4.45 (7.16)	3.92 (6.31)	3.44 (5.53)	2.94 (4.73)	2.45 (3.94)
Slip %	6.18	6.94	7.38	7.97	7.97	7.38

TRACTOR SOUND LEVEL WITH CAB		Front Wheel Drive dB(A) Disengaged dB(A)
Maximum Available Power—Two Hours		78.0 78.5
75% of Pull at Maximum Power—Ten Hours		79.0
50% of Pull at Maximum Power—Two Hours		78.0
50% of Pull at Reduced Engine Speed—Two Hours		73.5
Bystander in 12th (H4) gear		89.5

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 7th (M3) Gear											
102.45 (76.40)	7573 (33.69)	5.07 (8.16)	2400	4.64	7.503 (28.403)	0.505 (0.307)	13.65 (2.690)	187 (85.8)	52 (11.1)	65 (18.3)	29.155 (98.452)

MAXIMUM POWER IN SELECTED GEARS

84.81 (63.24)	15641 (69.58)	2.03 (3.27)	2461	14.85	3rd (L3) Gear			179 (81.7)	43 (6.1)	48 (8.9)	28.890 (97.557)
105.47 (78.65)	7791 (34.66)	5.08 (8.17)	2399	4.53	7th (M3) Gear			187 (86.1)	49 (9.4)	56 (13.3)	29.250 (98.773)

TIRES, BALLAST AND WEIGHT

Rear Tires		With Ballast		Without Ballast	
Ballast	—No., size, ply & psi (kPa) —Liquid (each) —Cast Iron (each inner)	Four 18.4-38; 8; 14 (95) None 770 lb (349 kg)		Four 18.4-38; 8; 14 (95) None None	
Front Tires					
Ballast	—No., size, ply & psi (kPa) —Liquid (each) —Cast Iron (each)	Two 14.9-28; 6; 20 (140) None 128 lb (58 kg)		Two 14.9-28; 6; 20 (140) None None	
Height of Drawbar		20 in (510 mm)		20 in (510 mm)	
Static Weight with Operator—Rear		11740 lb (5325 kg)		10200 lb (4627 kg)	
		5255 lb (2384 kg)		5000 lb (2268 kg)	
		16995 lb (7709 kg)		15200 lb (6895 kg)	

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 141°F (60.4°C). Six 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. 1409.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers



Hesston 1380 DT Fiat Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
Roy G. Arnold, Director