

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1982

Test 1450: Hesston Fiat 1180DT Turbo and 1180 Turbo Diesel 12-Speed

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 1450: Hesston Fiat 1180DT Turbo and 1180 Turbo Diesel 12-Speed" (1982). *Nebraska Tractor Tests*. 1765.

<https://digitalcommons.unl.edu/tractormuseumlit/1765>

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 1450 — HESSTON 1180DT TURBO FIAT DIESEL ALSO HESSTON 1180 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—1038 rpm)

107.48 (80.15)	2550	6.673 (25.260)	0.433 (0.263)	16.11 (3.173)	188 (86.8)	67 (19.3)	75 (23.9)	28.983 (97.872)
-------------------	------	-------------------	------------------	------------------	---------------	--------------	--------------	--------------------

Standard Power Take-off Speed (1000 rpm)—One Hour

104.22 (77.72)	2458	6.353 (24.049)	0.425 (0.259)	16.40 (3.232)	187 (86.1)	71 (21.5)	76 (24.3)	28.995 (97.912)
-------------------	------	-------------------	------------------	------------------	---------------	--------------	--------------	--------------------

VARYING POWER AND FUEL CONSUMPTION—Two Hours

93.65 (69.83)	2613	6.140 (23.242)	0.457 (0.278)	15.25 (3.004)	186 (85.3)	70 (21.1)	75 (23.9)	..... .....
0.00 (0.00)	2691	2.242 (8.487)	..... .....	..... .....	175 (79.4)	70 (21.1)	75 (23.9)	..... .....
47.66 (35.54)	2660	4.135 (15.653)	0.605 (0.368)	11.53 (2.270)	180 (82.2)	70 (20.8)	74 (23.6)	..... .....
108.39 (80.83)	2548	6.708 (25.393)	0.431 (0.263)	16.16 (3.183)	189 (87.2)	70 (20.8)	75 (23.9)	..... .....
23.82 (17.76)	2674	3.145 (11.905)	0.921 (0.560)	7.57 (1.492)	175 (79.4)	70 (21.1)	76 (24.2)	..... .....
70.64 (52.68)	2633	5.086 (19.253)	0.502 (0.305)	13.89 (2.736)	185 (85.0)	71 (21.7)	76 (24.7)	..... .....
Av 57.36 Av (42.77)	2637	4.576 (17.322)	0.556 (0.338)	12.54 (2.469)	182 (83.1)	70 (21.1)	75 (24.1)	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											
92.68 (69.11)	6500 (28.91)	5.35 (8.61)	2550	5.02	6.544 (24.772)	0.492 (0.299)	14.16 (2.790)	189 (87.2)	59 (14.7)	70 (21.1)	28.995 (97.912)
75% of Pull at Maximum Power—Ten Hours 7th (M3) Gear											
73.35 (54.69)	4920 (21.89)	5.59 (9.00)	2626	3.58	5.759 (21.799)	0.547 (0.333)	12.74 (2.509)	186 (85.8)	60 (15.5)	65 (18.6)	28.862 (97.463)
50% of Pull at Maximum Power—Two Hours 7th (M3) Gear											
50.27 (37.49)	3280 (14.59)	5.75 (9.25)	2669	2.43	4.823 (18.257)	0.669 (0.407)	10.42 (2.053)	181 (82.5)	54 (11.9)	57 (13.6)	28.990 (97.895)
50% of Pull at Reduced Engine Speed—Two Hours 9th (H1) Gear											
50.35 (37.55)	3280 (14.59)	5.76 (9.26)	1694	2.39	3.514 (13.302)	0.487 (0.296)	14.33 (2.823)	178 (81.1)	57 (13.6)	62 (16.4)	29.025 (98.013)

MAXIMUM POWER IN SELECTED GEARS

87.56 (65.29)	12905 (57.40)	2.54 (4.09)	2557	14.54	4th (L4) Gear		187 (86.1)	58 (14.4)	65 (18.3)	29.020 (97.996)
92.66 (69.10)	10302 (45.83)	3.37 (5.43)	2549	8.64	5th (M1) Gear		189 (87.2)	56 (13.3)	66 (18.9)	29.040 (98.064)
93.71 (69.88)	8048 (35.80)	4.37 (7.03)	2550	6.20	6th (M2) Gear		189 (86.9)	55 (12.8)	62 (16.7)	29.060 (98.131)
93.64 (69.83)	6560 (29.18)	5.35 (8.62)	2550	4.98	7th (M3) Gear		188 (86.4)	52 (11.1)	57 (13.9)	29.080 (98.199)
92.98 (69.34)	5344 (23.77)	6.52 (10.50)	2551	3.80	8th (M4) Gear		189 (86.9)	53 (11.7)	59 (15.0)	29.070 (98.165)
91.24 (68.04)	3971 (17.66)	8.62 (13.87)	2550	2.92	9th (H1) Gear		188 (86.7)	54 (12.2)	60 (15.6)	29.070 (98.165)

Department of Agricultural Engineering

Dates of Test: September 14-27, 1982

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 46.6 (rating taken from oil company's
inspection data) Specific gravity converted to 60°/
60° (15°/15°) 0.8373 Fuel weight 6.972 lbs/gal
(0.836 kg/l) Oil SAE 30 API service classifica-
tion SE-SF/CC-CD To motor 3.648 gal (13.807 l)
Drained from motor 3.140 gal (11.886 l) Trans-
mission and 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*300-258851* Crankshaft lengthwise
Rated rpm 2550 Bore and stroke 4.055" × 4.33"
(103 mm × 110 mm) Compression ratio 15.7 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 full flow paper cartridges Oil cooler
engine coolant heat exchanger for crankcase oil
Fuel filter two paper elements Muffler vertical
Cooling medium temperature control one ther-
mostat.

CHASSIS: Type front wheel assist with duals
Serial No. 1280DT/12*760534* Tread width
rear 64.6" (1640 mm) to 118.5" (3010 mm) front
70.7" (1797 mm) to 88" (2235 mm) Wheel base
105.2" (2673 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 1.6 (2.6)
second 2.0 (3.2) third 2.4 (3.9) fourth 2.9 (4.7)
fifth 3.7 (5.9) sixth 4.6 (7.4) seventh 5.6 (9.0)
eighth 6.7 (10.8) ninth 8.8 (14.2) tenth 11.1 (17.9)
eleventh 13.4 (21.6) twelfth 16.2 (26.1) reverse 3.7
(6.0), 4.7 (7.6), 5.7 (9.2), 6.9 (11.1) Clutch dry
single disc hydraulically actuated and 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 sur-
face 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" (10.73 m) (on concrete surface without
brake) right 497" (12.63 m) left 497" (12.63 m)
Power take-off 540 rpm at 2261 engine rpm and
1000 rpm at 2458 engine rpm.

LUGGING ABILITY IN 7th (M3) GEAR

Crankshaft Speed rpm	2550	2303	2045	1784	1539	1261	1019
Pull—lbs (kN)	6560 (29.18)	7064 (31.42)	7284 (32.40)	7322 (32.57)	7649 (34.02)	8001 (35.59)	7487 (33.30)
Increase in Pull %	0	8	11	12	17	22	14
Power—Hp (kW)	93.64 (69.83)	90.57 (67.54)	82.85 (61.78)	72.64 (54.17)	65.24 (48.65)	55.72 (41.55)	42.30 (31.54)
Speed—Mph (km/h)	5.35 (8.62)	4.81 (7.74)	4.27 (6.86)	3.72 (5.99)	3.20 (5.15)	2.61 (4.20)	2.12 (3.41)
Slip %	4.98	5.44	5.60	5.29	5.90	6.20	5.90

Front Wheel Drive

TRACTOR SOUND LEVEL WITH CAB

dB(A) Disengaged dB(A)

Maximum Available Power—Two Hours	80.0	79.5
75% of Pull at Maximum Power—Ten Hours		79.0
50% of Pull at Maximum Power—Two Hours		79.0
50% of Pull at Reduced Engine Speed—Two Hours		75.5
Bystander in 12th (H4) gear		88.5

DRAWBAR PERFORMANCE

(Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption 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 7th (M3) Gear											
93.68 (69.86)	6468 (28.77)	5.43 (8.74)	2549	3.73	6.580 (24.908)	0.490 (0.298)	14.24 (2.805)	189 (86.9)	62 (16.4)	73 (22.8)	28.930 (97.692)

MAXIMUM POWER IN SELECTED GEARS

86.50 (64.50)	15317 (68.13)	2.12 (3.41)	2574	14.93	3rd (L3) Gear			189 (86.9)	59 (15.0)	66 (18.9)	29.020 (97.996)
94.87 (70.75)	7999 (35.58)	4.45 (7.16)	2548	4.64	6th (M2) Gear			189 (86.9)	55 (12.8)	64 (17.8)	29.050 (98.097)
94.48 (70.46)	6521 (29.00)	5.43 (8.74)	2550	3.85	7th (M3) Gear			189 (86.9)	51 (10.6)	56 (13.3)	29.080 (98.199)

TIRES, BALLAST AND WEIGHT

Rear Tires

Ballast

—No., size, ply & psi (kPa)
—Liquid (each inner)
—Cast Iron (each)

With Ballast

Four 18.4-38; 8; 14 (95)
700 lb (318 kg)
None

Without Ballast

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
268 lb (121 kg)

Two 14.9-28; 6; 20 (140)
None
None

Height of Drawbar

22 in (560 mm)

22 in (560 mm)

Static Weight with Operator—Rear

Front

Total

11660 lb (5289 kg)

5225 lb (2370 kg)

16885 lb (7659 kg)

10260 lb (4654 kg)

4690 lb (2127 kg)

14950 lb (6781 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 was maintained at 144°F (62.2°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. 1450.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers



The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
Irvin T. Omtvedt, Dean and Director