1-1-1981

Test 1410: Hesston Fiat 1880 DT Diesel 12-Speed

Nebraska Tractor Test Lab
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NEBRASKA TRACTOR TEST 1410 — HESSTON 1880 DT FIAT DIESEL
ALSO HESSTON 1880 FIAT DIESEL
ALSO HESSTON 1880 DT TURBO FIAT DIESEL
AND HESSTON 1880 TURBO FIAT DIESEL
12 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—1061 rpm)								
162.48 *(121.16)*	2200	9.626 *(36.438)*	0.409 *(0.249)*	16.88 *(3.325)*	182 *(83.4)*	63 *(17.2)*	75 *(23.8)*	28.917 *(97.647)*
Standard Power Take-off Speed (1000 rpm)—One Hour								
159.83 *(119.19)*	2074	9.213 *(34.875)*	0.398 *(0.242)*	17.35 *(3.418)*	183 *(83.8)*	62 *(16.7)*	75 *(23.9)*	28.960 *(97.794)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
141.18 *(105.28)*	2248	8.625 *(32.649)*	0.421 *(0.256)*	16.37 *(3.225)*	182 *(83.3)*	62 *(16.7)*	75 *(23.9)*	....
0.00 *(0.00)*	2418	2.732 *(10.342)*	....	....	180 *(82.2)*	62 *(16.7)*	75 *(23.9)*	....
73.55 *(54.85)*	2346	5.585 *(21.142)*	0.524 *(0.319)*	13.17 *(2.594)*	181 *(82.8)*	62 *(16.7)*	75 *(23.9)*	....
163.75 *(122.11)*	2200	9.635 *(36.472)*	0.406 *(0.247)*	17.00 *(3.348)*	183 *(83.6)*	63 *(16.9)*	76 *(24.2)*	....
37.45 *(27.93)*	2382	4.158 *(15.740)*	0.766 *(0.466)*	9.01 *(1.774)*	180 *(82.2)*	62 *(16.7)*	75 *(23.9)*	....
108.39 *(80.83)*	2300	7.068 *(26.755)*	0.450 *(0.274)*	15.33 *(3.021)*	182 *(83.1)*	62 *(16.7)*	75 *(23.9)*	....
Av 87.39 *Av (65.17)*	**2315**	**6.301** *(23.852)*	**0.497** *(0.303)*	**13.87** *(2.732)*	**181** *(82.9)*	**62** *(16.7)*	**75** *(23.9)*	**28.980** *(97.861)*

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

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											
135.64 *(101.14)*	9360 *(41.63)*	5.43 *(8.75)*	2201	5.92	9.334 *(35.332)*	0.475 *(0.289)*	14.53 *(2.863)*	173 *(78.3)*	59 *(14.7)*	59 *(14.7)*	28.730 *(97.017)*
75% of Pull at Maximum Power—Ten Hours 7th (M3) Gear											
109.88 *(81.94)*	7181 *(31.94)*	5.74 *(9.23)*	2289	4.49	8.090 *(30.626)*	0.508 *(0.309)*	13.58 *(2.676)*	178 *(81.1)*	52 *(11.1)*	55 *(12.6)*	28.659 *(96.777)*
50% of Pull at Maximum Power—Two Hours 7th (M3) Gear											
76.59 *(57.12)*	4818 *(21.43)*	5.96 *(9.60)*	2335	2.53	6.343 *(24.012)*	0.571 *(0.347)*	12.07 *(2.379)*	175 *(79.2)*	52 *(11.1)*	66 *(18.9)*	28.945 *(97.743)*
50% of Pull at Reduced Engine Speed—Two Hours 9th (H1) Gear											
76.23 *(56.84)*	4797 *(21.34)*	5.96 *(9.59)*	1481	2.78	5.020 *(19.004)*	0.454 *(0.276)*	15.18 *(2.991)*	171 *(77.2)*	58 *(14.4)*	61 *(16.1)*	28.810 *(97.287)*
MAXIMUM POWER IN SELECTED GEARS											
111.16 *(82.89)*	15656 *(69.64)*	2.66 *(4.28)*	2253	14.82	4th (L4) Gear			172 *(77.8)*	57 *(13.9)*	58 *(14.4)*	28.700 *(96.916)*
129.73 *(96.74)*	14702 *(65.40)*	3.31 *(5.33)*	2199	12.63	5th (M1) Gear			176 *(80.0)*	49 *(9.4)*	62 *(16.7)*	29.010 *(97.962)*
137.74 *(102.72)*	11697 *(52.03)*	4.42 *(7.11)*	2201	7.51	6th (M2) Gear			176 *(80.0)*	49 *(9.4)*	61 *(16.1)*	29.030 *(98.030)*
138.81 *(103.51)*	9565 *(42.55)*	5.44 *(8.76)*	2200	5.72	7th (M3) Gear			176 *(79.7)*	48 *(8.9)*	57 *(13.9)*	29.080 *(98.199)*
138.77 *(103.48)*	7824 *(34.80)*	6.65 *(10.70)*	2200	4.52	8th (M4) Gear			176 *(80.0)*	50 *(10.0)*	63 *(17.2)*	29.000 *(97.929)*
138.09 *(102.97)*	5876 *(26.14)*	8.81 *(14.18)*	2200	3.28	9th (H1) Gear			176 *(80.0)*	51 *(10.6)*	64 *(17.8)*	28.990 *(97.895)*

Department of Agricultural Engineering

Dates of Test: September 29 to October 6, 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** 4.028 gal *(15.248 l)* **Drained from motor** 3.294 gal *(12.468 l)* **Transmission lubricant** SAE 20W-40 **Final drive lubricant** API 303 **Total time engine was operated** 38.0 hours.

ENGINE: Make Fiat Diesel **Type** six cylinder vertical with turbocharger **Serial No.** CM8365.25*500*161174* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.528″ × 5.118″ *(115 mm × 130 mm)* **Compression ratio** 15.5 to 1 **Displacement** 494 cu in *(8102 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** one paper cartridge, one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist with duals **Serial No.** 1880 DT/12* 745695* **Tread width** rear 64.6″ *(1640 mm)* to 121″ *(3075 mm)* front 74.8″ *(1900 mm)* to 86.6″ *(2200 mm)* **Wheel base** 113.6″ *(2885 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 37.2″ *(945 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 1.7 *(2.7)* second 2.1 *(3.4)* third 2.5 *(4.1)* fourth 3.1 *(4.9)* fifth 3.8 *(6.1)* sixth 4.8 *(7.7)* seventh 5.8 *(9.3)* eighth 7.0 *(11.3)* ninth 9.2 *(14.7)* tenth 11.6 *(18.6)* eleventh 14.0 *(22.5)* twelfth 16.9 *(27.1)* reverse 3.9 *(6.2)*, 4.9 *(7.9)*, 5.9 *(9.5)*, 7.2 *(11.5)* **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 225″ *(5.72 m)* left 233″ *(5.91 m)* (on concrete surface without brake) right 265″ *(6.72 m)* left 267″ *(6.77 m)* **Turning space diameter** (on concrete surface with brake applied) right 467″ *(11.87 m)* left 482″ *(12.25 m)* (on concrete surface without brake) right 546″ *(13.87 m)* left 550″ *(13.97 m)* **Power take-off** 1000 rpm at 2074 engine rpm.

LUGGING ABILITY IN 7th (M3) GEAR

Crankshaft Speed rpm	2200	1984	1757	1540	1319	1093
Pull—lbs	9565	10377	10969	11688	12074	11179
(kN)	*(42.55)*	*(46.16)*	*(48.79)*	*(51.99)*	*(53.71)*	*(49.72)*
Increase in Pull %	0	8	15	22	26	17
Power—Hp	138.81	134.86	125.61	116.51	102.56	79.36
(kW)	*(103.51)*	*(100.56)*	*(93.67)*	*(86.88)*	*(76.48)*	*(59.18)*
Speed—Mph	5.44	4.87	4.29	3.74	3.19	2.66
(km/h)	*(8.76)*	*(7.84)*	*(6.91)*	*(6.02)*	*(5.13)*	*(4.28)*
Slip %	5.72	6.28	6.74	7.36	7.97	7.21

TRACTOR SOUND LEVEL WITH CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	81.0	81.0
75% of Pull at Maximum Power—Ten Hours		80.5
50% of Pull at Maximum Power—Two Hours		79.5
50% of Pull at Reduced Engine Speed—Two Hours		75.5
Bystander in 12th (H4) gear		88.0

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											
136.47	9220	5.55	2199	4.40	9.370	0.474	14.56	174	60	61	28.760
(101.76)	*(41.01)*	*(8.93)*			*(35.469)*	*(0.288)*	*(2.869)*	*(78.6)*	*(15.6)*	*(16.1)*	*(97.118)*
MAXIMUM POWER IN SELECTED GEARS											
127.10	18223	2.62	2208	14.87	4th (L4) Gear			173	58	59	28.720
(94.78)	*(81.06)*	*(4.21)*						*(78.3)*	*(14.4)*	*(15.0)*	*(96.983)*
139.96	11576	4.53	2200	5.57	6th (M2) Gear			176	48	60	29.050
(104.37)	*(51.49)*	*(7.30)*						*(80.0)*	*(8.9)*	*(15.6)*	*(98.097)*
140.40	9473	5.56	2199	4.11	7th (M3) Gear			176	48	59	29.070
(104.69)	*(42.14)*	*(8.94)*						*(80.0)*	*(8.9)*	*(15.0)*	*(98.165)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8-38; 8; 14 *(95)*	Four 20.8-38; 8; 14 *(95)*
Ballast	—Liquid (each inner)	1165 lb *(528 kg)*	None
	—Cast Iron (each inner)	300 lb *(136 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 16.9-28; 6; 16 *(110)*	Two 16.9-28; 6; 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	45 lb *(20 kg)*	None
Height of Drawbar		20 in *(510 mm)*	20 in *(510 mm)*
Static Weight with Operator—Rear		14160 lb *(6423 kg)*	11230 lb *(5094 kg)*
Front		5550 lb *(2517 kg)*	5460 lb *(2477 kg)*
Total		19710 lb *(8940 kg)*	16690 lb *(7571 kg)*

REPAIRS and ADJUSTMENTS: During preliminary PTO testing, the fuel sediment bowl cracked. The bowl and gasket were replaced and test continued. During the maximum available power drawbar test the rear support strap of the lower fuel tank fell off. This was replaced at the end of this test.

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 133°F *(56.0°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. **1410.**

LOUIS I. LEVITICUS
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Hesston 1880 DT Fiat Diesel

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