10-10-1985

Test 1580: Hesston 100-90 Fiat Diesel 15-Speed

Nebraska Tractor Test Lab
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NEBRASKA TRACTOR TEST 1580—HESSTON 100-90 FIAT DIESEL 15 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 — 1038 rpm)								
91.52 (68.24)	2500	5.725 (21.673)	0.439 (0.267)	15.98 (3.149)	196 (90.9)	63 (17.2)	75 (23.8)	28.84 (97.39)
Standard Power Take-off Speed (1000 rpm) — One Hour								
90.57 (67.54)	2409	5.578 (21.116)	0.432 (0.263)	16.24 (3.198)	196 (91.2)	63 (17.2)	74 (23.1)	28.92 (97.66)
Standard Power Take-off Speed (540 rpm) — One Hour								
87.16 (64.99)	2124	5.139 (19.453)	0.413 (0.251)	16.96 (3.341)	199 (93.0)	66 (18.7)	75 (23.8)	29.00 (97.93)
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
81.66 (60.89)	2625	5.199 (19.680)	0.446 (0.272)	15.71 (3.094)	190 (87.8)	64 (17.8)	75 (23.6)	....
0.00 (0.00)	2748	1.951 (7.386)	....	....	175 (79.4)	64 (17.8)	75 (23.9)	....
41.77 (31.15)	2683	3.320 (12.569)	0.557 (0.339)	12.58 (2.478)	182 (83.3)	64 (17.5)	74 (23.3)	....
91.30 (68.08)	2501	5.712 (21.624)	0.439 (0.267)	15.98 (3.149)	197 (91.4)	66 (18.9)	77 (25.0)	....
21.20 (15.81)	2725	2.632 (9.962)	0.870 (0.529)	8.06 (1.587)	178 (81.1)	65 (18.3)	75 (23.9)	....
62.03 (46.26)	2661	4.223 (15.987)	0.477 (0.290)	14.69 (2.893)	189 (87.2)	65 (18.3)	75 (23.9)	....
Av 49.66	**2657**	**3.840**	**0.542**	**12.93**	**185**	**65**	**75**	**28.95**
Av (37.03)		***(14.535)***	***(0.330)***	***(2.548)***	***(85.0)***	***(18.1)***	***(23.9)***	***(97.75)***

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 11th (III-1) Gear											
77.98 (58.15)	4602 (20.47)	6.35 (10.23)	2500	4.89	5.727 (21.678)	0.515 (0.313)	13.62 (2.682)	193 (89.2)	45 (7.2)	54 (12.2)	28.88 (97.52)
75% of Pull at Maximum Power — Ten Hours 11th (III-1) Gear											
63.16 (47.10)	3487 (15.51)	6.79 (10.93)	2666	4.71	4.948 (18.730)	0.549 (0.334)	12.76 (2.515)	186 (85.6)	37 (2.5)	37 (3.0)	29.15 (98.45)
50% of Pull at Maximum Power — Two Hours 11th (III-1) Gear											
43.19 (32.21)	2324 (10.34)	6.97 (11.22)	2687	2.93	4.044 (15.307)	0.656 (0.399)	10.68 (2.104)	183 (83.6)	37 (2.5)	39 (3.6)	29.14 (98.38)
50% of Pull at Reduced Engine Speed — Two Hours 13th (III-3) Gear											
43.21 (32.22)	2323 (10.33)	6.98 (11.23)	1536	2.70	3.074 (11.635)	0.499 (0.303)	14.06 (2.769)	183 (83.6)	40 (4.2)	42 (5.6)	29.14 (98.40)
MAXIMUM POWER IN SELECTED GEARS											
66.40 (49.52)	9911 (44.09)	2.51 (4.04)	2624	14.87	7th (II-2) Gear			184 (84.4)	44 (6.7)	48 (8.9)	28.77 (97.15)
77.57 (57.85)	8907 (39.62)	3.27 (5.26)	2499	11.30	8th (II-3) Gear			192 (88.6)	43 (6.1)	48 (8.9)	28.78 (97.19)
78.53 (58.56)	6920 (30.78)	4.26 (6.85)	2500	7.92	9th (II-4) Gear			192 (88.9)	44 (6.7)	49 (9.4)	28.79 (97.22)
77.85 (58.05)	5353 (23.81)	5.45 (8.78)	2499	5.73	10th (II-5) Gear			191 (88.3)	45 (7.2)	52 (11.1)	28.83 (97.35)
78.72 (58.70)	4646 (20.66)	6.35 (10.23)	2500	4.92	11th (III-1) Gear			193 (89.4)	45 (7.2)	54 (12.2)	28.90 (97.59)
74.98 (55.91)	3274 (14.56)	8.59 (13.82)	2500	3.73	12th (III-2) Gear			191 (88.1)	44 (6.7)	49 (9.4)	28.80 (97.25)

Department of Agricultural Engineering

Dates of Test: October 3 to 10, 1985

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F *(15/15°C)*** 0.8420 **Fuel weight** 7.011 lbs/gal *(0.840 kg/l)* **Oil SAE** 15W40 **API service classification** SF-CD **To motor** 3.596 gal *(13.611 l)* **Drained from motor** 3.133 gal *(11.858 l)* **Transmission and final drive lubricant** Hesston M&PS 705106016 fluid **Total time engine was operated** 37.0 hours.

ENGINE: Make Fiat/IVECO Diesel **Type** six cylinder vertical **Serial No.** 8065.06*200-042299* **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.937″ × 4.527″ *(100 mm × 115 mm)* **Compression ratio** 17 to 1 **Displacement** 331 cu in *(5419 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and centrifugal precleaner **Oil filter** two full flow cartridges **Fuel filter** two paper cartridges and water separator **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type front wheel assist **Serial No.** 100-90DT/15*248971* **Tread width** rear 63″ *(1600 mm)* to 86.5″ *(2197 mm)* front 67.5″ *(1714 mm)* to 84.5″ *(2146 mm)* **Wheel base** 99.8″ *(2534 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 37.1″ *(942 mm)* Vertical distance above roadway 37.8″ *(960 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 0.7 *(1.1)* second 0.8 *(1.3)* third 1.1 *(1.8)* fourth 1.4 *(2.3)* fifth 1.8 *(2.9)* sixth 2.0 *(3.3)* seventh 2.7 *(4.4)* eighth 3.6 *(5.8)* ninth 4.5 *(7.3)* tenth 5.6 *(9.1)* eleventh 6.5 *(10.5)* twelfth 8.7 *(14.0)* thirteenth 11.5 *(18.5)* fourteenth 14.3 *(23.1)* fifteenth 18.0 *(29.0)* reverse 0.8 *(1.3)*, 2.7 *(4.3)*, 8.6 *(13.9)* **Clutch** dry disc operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 197″ *(5.00 m)* left 197″ *(5.00 m)*(on concrete surface without brake) right 219″ *(5.56 m)* left 219″ *(5.56 m)* **Turning space diameter** (on concrete surface with brake applied) right 409″ *(10.39 m)* left 409″ *(10.39 m)*(on concrete surface without brake) right 453″ *(11.51 m)* left 453″ *(11.51 m)* **Power take-off** 540 rpm at 2124 engine rpm and 1000 rpm at 2409 engine rpm **Unladen tractor mass** 9540 lb *(4327 kg)*.

LUGGING ABILITY IN 11th (III-1) GEAR

Crankshaft Speed rpm	2500	2256	2000	1747	1496	1248
Pull—lbs *(kN)*	4646 *(20.66)*	5019 *(22.33)*	5451 *(24.25)*	5702 *(25.36)*	5755 *(25.60)*	5683 *(25.28)*
Increase in Pull %	0	8	17	23	24	22
Power—Hp *(kW)*	78.72 *(58.70)*	76.40 *(56.97)*	73.11 *(54.52)*	66.62 *(49.68)*	57.51 *(42.89)*	47.42 *(35.36)*
Speed—Mph *(km/h)*	6.35 *(10.23)*	5.71 *(9.19)*	5.03 *(8.09)*	4.38 *(7.05)*	3.75 *(6.03)*	3.13 *(5.04)*
Slip %	4.92	5.44	5.87	6.30	6.30	6.30

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Disengaged dB(A)	Engaged 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		74.5
Bystander in 15th (III-5) gear	86.5	

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 11th (III-1) Gear											
78.90 *(58.84)*	4875 *(21.69)*	6.07 *(9.77)*	2500	6.68	5.712 *(21.624)*	0.508 *(0.309)*	13.81 *(2.721)*	192 *(88.9)*	44 *(6.7)*	51 *(10.6)*	28.94 *(97.73)*
MAXIMUM POWER IN SELECTED GEARS											
63.09 *(47.04)*	7383 *(32.84)*	3.20 *(5.16)*	2627	14.80	8th (II-3) Gear			184 *(84.4)*	44 *(6.7)*	48 *(8.9)*	28.78 *(97.19)*
77.79 *(58.01)*	5620 *(25.00)*	5.19 *(8.35)*	2499	7.90	10th (II-5) Gear			192 *(88.6)*	45 *(7.2)*	52 *(11.1)*	28.82 *(97.32)*
79.42 *(59.22)*	4906 *(21.82)*	6.07 *(9.77)*	2500	6.61	11th (III-1) Gear			193 *(89.4)*	44 *(6.7)*	51 *(10.6)*	28.83 *(97.35)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-34; 6; 16 *(110)*	Two 18.4-34; 6; 16 *(110)*
Ballast	—Liquid (each)	550 lb *(250 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 14.9-24; 6; 16 *(110)*	Two 14.9-24; 6; 16 *(110)*
Ballast	—Liquid (each)	380 lb *(172 kg)*	None
	—Cast Iron (each)	None	None
Height of Drawbar		17.5 in *(445 mm)*	17.5 in *(445 mm)*
Static Weight with Operator	—Rear	7250 lb *(3289 kg)*	6150 lb *(2790 kg)*
	—Front	4330 lb *(1964 kg)*	3570 lb *(1619 kg)*
	—Total	11580 lb *(5253 kg)*	9720 lb *(4409 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 and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 160 °F *(71.0°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. **1580,** December 6, 1985.

LOUIS I. LEVITICUS
Engineer-in-Charge

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

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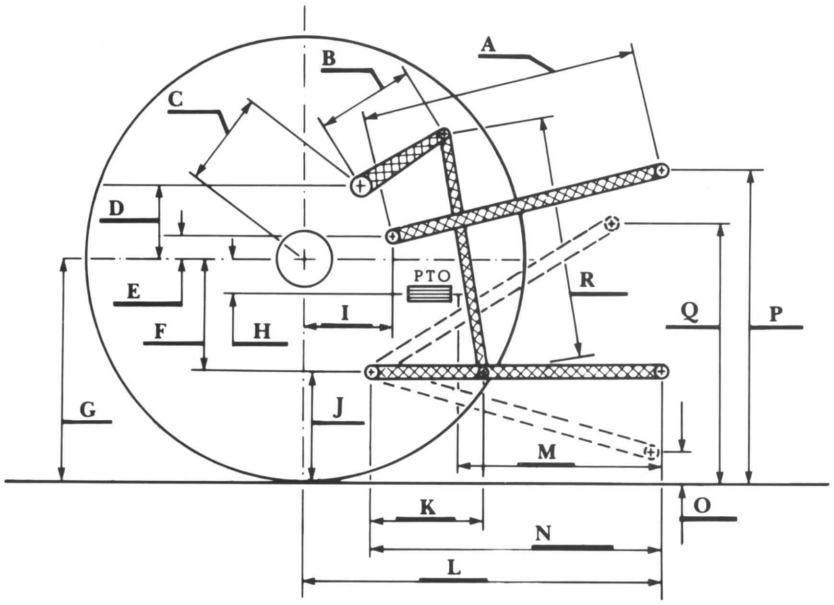
THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi *(kPa)*	** 2975	*(20510)*
Location	remote outlet	
Hydraulic oil temperature °F *(°C)*	200	*(93)*
Location	hydraulic filter	

	Maximum Lift Capacity		Lift Capacity for Transport
QUICK ATTACH	no		
CATEGORY	II		*not measured
LOAD lbs *(kg)*	5852	*(2654)*	
TIME sec	7.94		
HITCH POINT MOVEMENT in *(mm)*			
Lowest position	11.7	*(297)*	
Top of timed range	35.7	*(906)*	
Highest position	36.4	*(924)*	
LOAD CG MOVEMENT in *(mm)*			
Lowest position	11.7	*(297)*	
Top of timed range	37.3	*(947)*	
Highest position	39.0	*(991)*	

*Implement load capacity for transport purposes not specified by manufacturer.
** The observed maximum pressure at 1600 rpm, 2875 psi *(19820 kPa)* was outside the range specified by the manufacturer, 2700-2828 psi *(18615-19500 kPa)* at 1500-1700 rpm. The observed maximum pressure at rated engine speed was 2975 psi *(20510 kPa)*.



Hitch Dimensions as Tested — No Load

	inch	*mm*
A	29.0	*737*
B	9.0	*230*
C	15.3	*390*
D	14.1	*359*
E	8.1	*206*
F	9.3	*236*
G	29.2	*741*
H	1.3	*33*
I	14.4	*367*
J	19.9	*505*
K	17.5	*445*
L	44.1	*1120*
M	22.4	*570*
N	39.0	*990*
O	7.9	*200*
P	38.9	*987*
Q	34.6	*879*
R	28.4	*721*

Hesston 100-90 Diesel