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Test 1534: Hesston 160-90DT and 160-90 Turbo Fiat Diesels 16-Speeds

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1534—HESSTON 160-90DT TURBO FIAT DIESEL ALSO HESSTON 160-90 TURBO FIAT DIESEL

16 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption			Temperature ° (°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—1061 rpm)									
141.71 (105.68)	2200	8.376 (31.703)	0.412 (0.251)	16.92 (3.333)	180 (82.1)	70 (20.9)	75 (24.1)	29.42 (99.33)	
Standard Power Take-off Speed (1000 rpm) — One Hour									
143.91 (107.32)	2074	8.210 (31.076)	0.398 (0.242)	17.53 (3.453)	181 (82.9)	70 (20.9)	75 (23.7)	29.41 (99.31)	
VARYING POWER AND FUEL CONSUMPTION - Two Hours									
124.36 (92.74)	2272	7.589 (28.728)	0.426 (0.259)	16.39 (3.228)	176 (79.7)	71 (21.7)	76 (24.2)	..... .....
0.00 (0.00)	2425	2.560 (9.690)	..... .....	..... .....	175 (79.2)	71 (21.7)	75 (23.6)	..... .....
64.68 (48.23)	2364	5.029 (19.038)	0.542 (0.330)	12.86 (2.533)	175 (79.4)	71 (21.7)	76 (24.2)	..... .....
143.04 (106.67)	2200	8.420 (31.871)	0.410 (0.250)	16.99 (3.347)	179 (81.7)	71 (21.7)	76 (24.4)	..... .....
32.71 (24.39)	2391	3.838 (14.527)	0.818 (0.498)	8.52 (1.679)	175 (79.2)	71 (21.7)	75 (23.9)	..... .....
95.26 (71.04)	2323	6.363 (24.086)	0.466 (0.283)	14.97 (2.949)	177 (80.3)	71 (21.7)	76 (24.4)	..... .....
Av Av	76.68 (57.18)	2329	5.633 (21.323)	0.512 (0.312)	13.61 (2.681)	176 (79.9)	71 (21.7)	75 (24.1)	29.36 (99.16)

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel gal/hr (l/h)	Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. Cool- ing med	°F Air wet bulb	°C Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power — Two Hours 8th (III-2) Gear											
119.63 (89.21)	8433 (37.51)	5.32 (8.56)	2201	5.94	8.318 (31.486)	0.485 (0.295)	14.38 (2.833)	179 (81.7)	57 (13.6)	74 (23.3)	28.98 (97.86)
75% of Pull at Maximum Power - Ten Hours 8th (III-2) Gear											
97.22 (72.50)	6461 (28.74)	5.64 (9.08)	2291	4.26	7.138 (27.018)	0.512 (0.311)	13.62 (2.683)	178 (81.3)	62 (16.4)	69 (20.7)	28.87 (97.50)
50% of Pull at Maximum Power - Two Hours 8th (III-2) Gear											
67.24 (50.14)	4307 (19.16)	5.85 (9.42)	2342	2.94	5.679 (21.498)	0.589 (0.358)	11.84 (2.332)	178 (81.1)	58 (14.4)	80 (26.7)	28.95 (97.74)
50% of Pull at Reduced Engine Speed — Two Hours 12th (III-4) Gear											
67.22 (50.12)	4306 (19.15)	5.85 (9.42)	1562	2.77	4.603 (17.426)	0.478 (0.290)	14.60 (2.876)	177 (80.6)	58 (14.4)	80 (26.7)	28.93 (97.69)
MAXIMUM POWER IN SELECTED GEARS											
99.17 (73.95)	13848 (61.60)	2.69 (4.32)	2276	14.90	3rd (I-3) Gear			179 (81.7)	59 (15.0)	62 (16.7)	28.82 (97.32)
116.11 (86.59)	12961 (57.65)	3.36 (5.41)	2199	10.95	4th (I-4) Gear			178 (81.1)	46 (7.8)	48 (8.9)	28.97 (97.83)
119.61 (89.19)	11821 (52.58)	3.79 (6.11)	2200	9.13	5th (II-1) Gear			178 (81.1)	47 (8.3)	50 (10.0)	28.98 (97.86)
120.51 (89.86)	10579 (47.06)	4.27 (6.87)	2200	7.77	6th (III-1) Gear			178 (181.1)	49 (9.4)	53 (11.7)	28.98 (97.86)
121.31 (90.46)	9584 (42.63)	4.75 (7.64)	2199	6.77	7th (II-2) Gear			178 (181.1)	49 (9.4)	54 (12.2)	28.98 (97.86)
122.23 (91.15)	8614 (38.31)	5.32 (8.56)	2198	5.90	8th (III-2) Gear			179 (81.7)	54 (12.2)	66 (18.9)	29.00 (97.93)
121.39 (90.52)	7794 (34.67)	5.84 (9.40)	2200	5.34	9th (II-3) Gear			178 (81.1)	50 (10.0)	56 (13.3)	28.99 (97.89)
121.09 (90.30)	6953 (30.93)	6.53 (10.51)	2201	4.60	10th (III-3) Gear			178 (81.1)	51 (10.6)	58 (14.4)	28.99 (97.89)
120.10 (89.56)	6147 (27.34)	7.33 (11.79)	2198	4.03	11th (II-4) Gear			178 (81.1)	52 (11.1)	60 (15.6)	28.99 (97.89)
119.00 (88.74)	5460 (24.29)	8.17 (13.15)	2199	3.53	12th (III-4) Gear			178 (81.1)	53 (11.7)	62 (16.7)	29.00 (97.93)

Department of Agricultural Engineering

Dates of Test: September 25 to October 8, 1984

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 46.8 (rating taken from oil company's inspection data) Specific gravity converted to 60/60°F (15/15°C) 0.8375 Fuel weight 6.973 lbs/gal (0.836 kg/l) Oil SAE 15W-40 API service classification SE, SF, CC, CD To motor 3.866 gal (14.635 l) Drained from motor 3.422 gal (12.953 l) Transmission and final drive lubricant API 303 hydraulic fluid Total time engine was operated 43.5 hours.

ENGINE: Make Fiat/IVECO Diesel Type six cylinder vertical with turbocharger Serial No. 8365.25*503*755274* 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 and centrifugal precleaner Oil filter one full flow cartridge Oil cooler engine coolant heat exchanger for crankcase oil, engine coolant heat exchanger for transmission 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. 160-90DT/1S*261183* Tread width rear 60" (1524 mm) to 129" (3277 mm) front 64" (1625 mm) to 92" (2337 mm) Wheel base 113.8" (2890 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 2.1 (3.3) second 2.5 (4.0) third 3.0 (4.9) fourth 3.8 (6.1) fifth 4.2 (6.7) sixth 4.6 (7.4) seventh 5.1 (8.2) eighth 5.6 (9.1) ninth 6.1 (9.9) tenth 6.8 (11.0) eleventh 7.6 (12.3) twelfth 8.4 (13.6) thirteenth 10.4 (16.8) fourteenth 12.7 (20.5) fifteenth 15.4 (24.8) sixteenth 19.1 (30.7) reverse 1.6 (2.6), 2.0 (3.2), 2.4 (3.9), 3.0 (4.8), 3.4 (5.5), 3.7 (5.9), 4.0 (6.5), 4.5 (7.3), 4.9 (7.9), 5.5 (8.8), 6.1 (9.8), 6.8 (10.9), 8.1 (13.1), 10.2 (16.4), 12.3 (19.8), 15.3 (24.6) Clutch double dry disc hydraulically 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 225" (5.72 m) (on

LUGGING ABILITY IN 8th (III-2) GEAR

Crankshaft Speed rpm	2198	1983	1757	1545	1314	1092
Pull—lbs (kN)	8614 (38.31)	9387 (41.76)	9581 (42.62)	9729 (43.28)	9515 (42.32)	8631 (38.39)
Increase in Pull %	0	9	11	13	10	0
Power—Hp (kW)	122.23 (91.15)	119.25 (88.92)	107.61 (80.25)	95.87 (71.49)	79.95 (59.62)	60.72 (45.28)
Speed—Mph (km/h)	5.32 (8.56)	4.76 (7.67)	4.21 (6.78)	3.70 (5.95)	3.15 (5.07)	2.64 (4.25)
Slip %	5.90	6.61	6.77	6.92	6.77	6.14

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
Maximum Available Power—Two Hours	79.0	78.0
75% of Pull at Maximum Power—Ten Hours		78.5
50% of Pull at Maximum Power—Two Hours		78.0
50% of Pull at Reduced Engine Speed—Two Hours		75.5
Bystander in 16th (IV-4) gear		85.5

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)	Cool- ing med	Temp. °F (°C) Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power - Two Hours 8th (III-2) Gear											
120.08 (89.54)	8284 (36.85)	5.44 (8.75)	2200	4.92	8.303 (31.432)	0.482 (0.293)	14.46 (2.849)	179 (81.7)	60 (15.3)	62 (16.7)	28.84 (97.39)
MAXIMUM POWER IN SELECTED GEARS											
100.22 (74.74)	16644 (74.03)	2.26 (3.63)	2281	14.49			2nd (I-2) Gear	179 (81.4)	59 (15.0)	62 (16.7)	28.83 (97.35)
122.41 (91.28)	8436 (37.52)	5.44 (8.76)	2199	4.72			8th (III-2) Gear	179 (81.7)	53 (11.7)	64 (17.8)	29.00 (97.93)

TIRES, BALLAST AND WEIGHT

Rear Tires	—No., Size, ply & psi (kPa)	With Ballast	Without Ballast
		Four 20.8-38; 8; 14 (95)	Four 20.8-38; 8; 14 (95)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each inner)	490 lb (222 kg)	None
Front Tires	—No., Size, ply & psi (kPa)	Two 16.9-28; 6; 18 (125)	Two 16.9-28; 6; 18 (125)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	48 lb (22 kg)	None
Height of Drawbar		23.5 in (595 mm)	23.5 in (595 mm)
Static Weight with Operator—Rear		12655 lb (5740 kg)	11675 lb (5296 kg)
	—Front	5715 lb (2592 kg)	5620 lb (2549 kg)
	—Total	18370 lb (8332 kg)	17295 lb (7845 kg)

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi (kPa)	2425	16720
Location	remote	
Hydraulic oil temperature °F (°C)	190	88
Location	pump inlet	
	Maximum Lift Capacity	Lift Capacity for Transport
QUICK ATTACH	no	
CATEGORY	II	*not measured
LOAD lbs (kg)	**12516	5677
TIME sec	3.21	
HITCH POINT MOVEMENT in (mm)		
Lowest position	11.1	283
Top of timed range	35.1	892
Highest position	36.1	918
LOAD CG MOVEMENT in (mm)		
Lowest position	12.0	305
Top of timed range	34.5	876
Highest position	35.6	903

*Implement load capacity for transport purposes not specified by manufacturer.

**Manufacturers advertised capacity was 13450 lbs. (6100 kg)

concrete surface without brake) right 265" (6.72 m) left 265" (6.72 m) **Turning space diameter** (on concrete surface with brake applied) right 467" (11.87 m) left 467" (11.87 m) (on concrete surface without brake) right 546" (13.87 m) left 546" (13.87 m) **Power take-off** 540 rpm at 1950 engine rpm and 1000 rpm at 2074 engine rpm **Unladen tractor mass** 15520 lb (7040 kg).

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

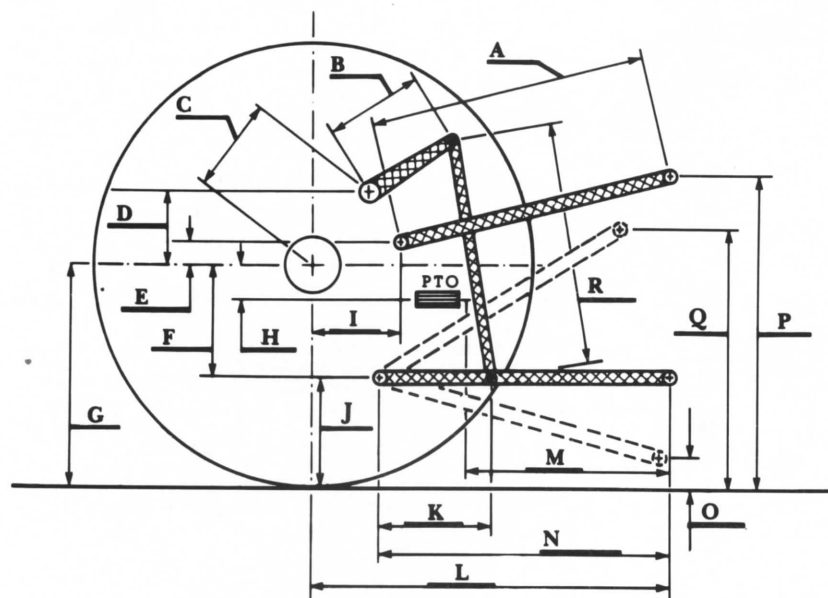
REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 133°F (56.0 °C). Ten 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. 1534, December 10, 1984.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD

Board of Tractor Test Engineers



Hitch Dimensions as Tested — No Load

	inch	mm
A	31.5	800
B	10.8	275
C	16.9	430
D	16.1	409
E	9.0	229
F	11.0	280
G	34.0	864
H	2.5	64
I	16.7	425
J	23.0	584
K	21.5	546
L	48.5	1232
M	26.2	665
N	40.0	1016
O	8.0	203
P	42.0	1067
Q	36.8	933
R	35.5	902



Hesston 160-90DT Diesel