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Test 1352: Hesston Fiat 680 DT and 680 Diesel 8-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1352 — HESSTON FIAT 680 DT DIESEL ALSO HESSTON FIAT 680 DIESEL 8 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)									
62.47 (46.58)	2500	3.634 (13.757)	0.411 (0.250)	17.19 (3.386)	191 (88.3)	68 (20.0)	75 (23.9)	28.863 (97.467)	
Standard Power Take-Off Speed (1000 rpm)—One Hour									
61.20 (45.64)	2408	3.517 (13.315)	0.406 (0.247)	17.40 (3.428)	191 (88.2)	67 (19.6)	75 (23.7)	28.865 (97.473)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
55.45 (41.35)	2612	3.258 (12.334)	0.415 (0.252)	17.02 (3.353)	185 (85.0)	68 (19.7)	75 (23.9)	..... .....
0.00 (0.00)	2782	1.100 (4.165)	..... .....	..... .....	168 (75.6)	67 (19.4)	74 (23.6)	..... .....
28.70 (21.40)	2703	2.111 (7.992)	0.520 (0.316)	13.59 (2.678)	174 (78.6)	68 (19.7)	75 (23.9)	..... .....
62.68 (46.74)	2500	3.641 (13.781)	0.410 (0.250)	17.22 (3.391)	193 (89.4)	67 (19.4)	75 (23.9)	..... .....
14.64 (10.92)	2754	1.602 (6.062)	0.772 (0.470)	9.14 (1.801)	169 (76.1)	67 (19.4)	75 (23.9)	..... .....
42.38 (31.60)	2659	2.651 (10.034)	0.442 (0.269)	15.99 (3.149)	180 (82.5)	68 (20.3)	75 (23.9)	..... .....
Av Av	33.97 (25.34)	2668 (9.062)	2.394 (0.303)	0.498 (0.303)	14.19 (2.796)	178 (81.2)	67 (19.7)	75 (23.8)	28.870 (97.490)

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)	Cool- ing med	Temp. °F (°C) Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 5th (1 H) Gear											
52.93 (39.47)	3654 (16.25)	5.43 (8.74)	2500	5.63	3.575 (13.535)	0.477 (0.290)	14.80 (2.916)	193 (89.2)	66 (18.9)	74 (23.3)	28.815 (97.304)
75% of Pull at Maximum Power—Ten Hours 5th (1 H) Gear											
42.48 (31.67)	2769 (12.32)	5.75 (9.26)	2610	4.34	2.991 (11.324)	0.497 (0.303)	14.20 (2.797)	191 (88.3)	75 (23.7)	85 (29.2)	28.621 (96.649)
50% of Pull at Maximum Power—Two Hours 5th (1 H) Gear											
29.54 (22.03)	1853 (8.24)	5.98 (9.62)	2675	2.91	2.372 (8.978)	0.567 (0.345)	12.45 (2.453)	185 (85.0)	75 (23.6)	87 (30.6)	28.610 (96.612)
50% of Pull at Reduced Engine Speed—Two Hours 6th (2 H) Gear											
29.64 (22.10)	1858 (8.27)	5.98 (9.63)	1856	2.98	2.000 (7.571)	0.477 (0.290)	14.82 (2.919)	190 (87.8)	78 (25.3)	92 (33.3)	28.600 (96.578)
MAXIMUM POWER IN SELECTED GEARS											
49.65 (37.02)	6252 (27.81)	2.98 (4.79)	2541	14.68	3rd (3 L) Gear			191 (88.3)	66 (18.9)	72 (22.2)	28.750 (97.084)
52.42 (39.09)	4796 (21.34)	4.10 (6.60)	2501	7.88	4th (4 L) Gear			195 (90.6)	74 (23.3)	82 (27.8)	28.630 (96.679)
53.65 (40.01)	3697 (16.45)	5.44 (8.76)	2500	5.53	5th (1 H) Gear			198 (91.9)	73 (22.8)	79 (26.1)	28.620 (96.645)
52.35 (39.03)	2454 (10.92)	8.00 (12.87)	2501	3.77	6th (2 H) Gear			196 (91.1)	74 (23.3)	84 (28.9)	28.610 (96.612)
LUGGING ABILITY IN 5th (1 H) GEAR											
Crankshaft Speed rpm				2500	2253	2001	1750	1503	1256		
Pull—lbs (kN)				3697 (16.45)	3818 (16.98)	3947 (17.56)	3973 (17.67)	3972 (17.67)	3803 (16.91)		
Increase in Pull %				0	3	7	7	7	3		
Power—Hp (kW)				53.65 (40.01)	49.80 (37.14)	45.61 (34.01)	40.13 (29.92)	34.44 (25.68)	27.62 (20.60)		
Speed—Mph (km/h)				5.44 (8.76)	4.89 (7.87)	4.33 (6.97)	3.79 (6.10)	3.25 (5.23)	2.72 (4.38)		
Slip %				5.53	5.80	5.94	5.94	6.08	5.94		

Department of Agricultural Engineering

Dates of Test: May 30—June 10, 1980

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 47.9 (rating taken from oil company's
inspection data) Specific gravity converted to
60°/60° (15°/15°) 0.8482 Fuel weight 7.062 lbs/gal
(0.846 kg/l) Oil SAE 20W-40 API service classi-
fication Mil-L-2104B EP To motor 2.538 gal
(9.606 l) Drained from motor 2.361 gal (8.936 l)
Transmission and final drive lubricant Olio fiat
AF 87 Front axle lubricant Olio fiat AMBRA
20W-40 Total time engine was operated 42.5
hours.

ENGINE Make Fiat Dsl Type four cylinder
vertical Serial No. 8045-02-270-00-1598
Crankshaft lengthwise Rated rpm 2500 Bore
and stroke 3.937" × 4.331" (100 mm × 110 mm)
Compression ratio 17.0 to 1 Displacement 211 cu
in (3456 ml) Starting system 12 volt Lubrication
pressure Air cleaner two paper elements Oil
filter one full flow paper cartridge Fuel filter two
paper cartridges and one gauze screen Muffler
vertical Cooling medium temperature control
one thermostat

CHASSIS: Type front wheel assist Serial No.
680DT/8-036386 Tread width rear 59.1" (1500
mm) to 76.0" (1930 mm) front 55.1" (1400 mm) to
82.7" (2100 mm) Wheel base 89.8" (2280 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 31.3" (794
mm) Vertical distance above roadway 36.3" (922
mm) Horizontal distance from center of rear wheel
tread 0" (0 mm) to the right/left Hydraulic control
system direct engine drive Transmission Selec-
tive gear fixed ratio Advertised speeds mph
(km/h) first 1.6 (2.5) second 2.3 (3.7) third 3.4 (5.5)
fourth 4.4 (7.1) fifth 5.7 (9.2) sixth 8.2 (13.2)
seventh 12.3 (19.8) eighth 15.9 (25.6) reverse 2.1
(3.3), 7.4 (11.9) Clutch dual 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 191" (4.85 m) left
189" (4.80 m) (on concrete surface without brake)
right 214" (5.44 m) left 213" (5.41 m) Turning
space diameter (on concrete surface with brake
applied) right 393" (9.98 m) left 389" (9.88 m) (on
concrete surface without brake) right 438" (11.13
m) left 436" (11.07 m) Power take-off 1000 rpm at
2408 engine rpm and 540 rpm at 2230 engine
rpm.

REPAIRS and ADJUSTMENTS: The hyd-
raulic hitch control level linkage required adjust-
ment following the drawbar tests.

TRACTOR SOUND LEVEL WITH CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	84.0	83.0
75% of Pull at Maximum Power—Ten Hours	—	81.5
50% of Pull at Maximum Power—Two Hours	—	81.5
50% of Pull at Reduced Engine Speed—Two Hours	—	78.5
Bystander in 8th (4 H) gear	—	87.0

**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)	Cool- ing med	Temp. °F (°C) Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 5th (1 H) Gear											
53.33 (39.77)	3571 (15.88)	5.60 (9.01)	2500	3.81	3.593 (13.602)	0.476 (0.289)	14.84 (2.924)	194 (90.0)	66 (18.6)	75 (23.9)	28.925 (97.675)

MAXIMUM POWER IN SELECTED GEARS

48.88 (36.45)	8923 (39.69)	2.05 (3.31)	2586	14.88	2nd (2 L) Gear			185 (84.7)	66 (18.9)	71 (21.7)	28.750 (97.084)
53.76 (40.09)	4693 (20.88)	4.30 (6.91)	2503	4.67	4th (4 L) Gear			197 (91.4)	74 (23.3)	83 (28.3)	28.620 (96.645)
54.87 (40.92)	3674 (16.34)	5.60 (9.01)	2500	3.81	5th (1 H) Gear			194 (90.0)	66 (18.9)	75 (23.9)	28.910 (97.625)

TIRES, BALLAST AND WEIGHT

Rear Tires	—No., size, ply & psi (kPa)	With Ballast	Without Ballast
Ballast	—Liquid (each)	Two 13.6R38; 6; 22 (150)	Two 13.6R38; 6; 22 (150)
	—Cast Iron (each)	None	None
		588 lb (267 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 11.2R28; 8; 24 (165)	Two 11.2R28; 8; 24 (165)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	743 lb (337 kg)	None
Height of Drawbar		21 in (535 mm)	21 in (535 mm)
Static Weight with Operator—Rear		5950 lb (2699 kg)	4775 lb (2166 kg)
—Front		4050 lb (1837 kg)	2565 lb (1163 kg)
—Total		10000 lb (4536 kg)	7340 lb (3329 kg)

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 143°F (61.6°C). Four 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 **1352**.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



Hesston Fiat 680 DT Diesel