

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1984

Test 1532: Hesston 80-66DT and 80-66 Fiat Diesel 12-Speeds

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 1532: Hesston 80-66DT and 80-66 Fiat Diesel 12-Speeds" (1984).
Nebraska Tractor Tests. 1843.

<https://digitalcommons.unl.edu/tractormuseumlit/1843>

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 1532—HESSTON 80-66DT FIAT DIESEL ALSO HESSTON 80-66 FIAT DIESEL 12 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—1050 rpm)								
70.43 (52.52)	2500	4.142 (15.676)	0.410 (0.249)	17.01 (3.350)	188 (86.8)	60 (15.7)	75 (24.1)	28.99 (97.88)
Standard Power Take-off Speed (1000 rpm) — One Hour								
68.91 (51.39)	2381	4.001 (15.144)	0.405 (0.246)	17.22 (3.393)	190 (87.8)	60 (15.5)	78 (25.3)	28.98 (97.86)
Standard Power Take-off Speed (540 rpm) — One Hour								
65.20 (48.62)	2198	3.704 (14.021)	0.396 (0.241)	17.60 (3.467)	192 (88.6)	64 (17.7)	81 (26.9)	28.93 (97.69)

VARYING POWER AND FUEL CONSUMPTION — Two Hours

62.62 (46.70)	2616	3.756 (14.217)	0.418 (0.254)	16.67 (3.285)	184 (84.4)	62 (16.4)	78 (25.3)	.....
0.00 (0.00)	2720	1.157 (4.381)	.....	.....	163 (72.5)	63 (17.2)	79 (25.8)	.....
32.38 (24.14)	2705	2.409 (9.120)	0.519 (0.316)	13.44 (2.647)	176 (80.0)	62 (16.7)	80 (26.4)	.....
71.37 (53.22)	2501	4.229 (16.009)	0.413 (0.251)	16.87 (3.324)	191 (88.3)	62 (16.7)	80 (26.7)	.....
16.39 (12.22)	2737	1.803 (6.824)	0.767 (0.466)	9.09 (1.791)	168 (75.3)	62 (16.4)	80 (26.4)	.....
47.92 (35.73)	2668	3.033 (11.481)	0.441 (0.268)	15.80 (3.112)	180 (81.9)	62 (16.4)	79 (26.1)	.....
Av 38.45 (28.67)	2658	2.731 (10.339)	0.495 (0.301)	14.08 (2.773)	177 (80.4)	62 (16.6)	79 (26.1)	28.95 (97.74)

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 8th (III-1) Gear											
62.20 (46.38)	4260 (18.95)	5.48 (8.81)	2500	6.73	4.159 (15.743)	0.466 (0.284)	14.96 (2.946)	184 (84.2)	60 (15.6)	67 (19.2)	29.00 (97.93)
75% of Pull at Maximum Power — Ten Hours 8th (III-1) Gear											
50.39 (37.58)	3187 (14.18)	5.93 (9.54)	2670	5.41	3.547 (13.425)	0.491 (0.299)	14.21 (2.799)	179 (81.4)	59 (14.8)	61 (16.0)	28.96 (97.78)
50% of Pull at Maximum Power — Two Hours 8th (III-1) Gear											
34.76 (25.92)	2140 (9.52)	6.09 (9.80)	2685	3.45	2.746 (10.396)	0.551 (0.335)	12.66 (2.494)	172 (77.8)	63 (16.9)	66 (18.6)	28.82 (97.32)
50% of Pull at Reduced Engine Speed — Two Hours 10th (III-2) Gear											
34.77 (25.93)	2139 (9.51)	6.10 (9.81)	1741	3.14	2.230 (8.442)	0.447 (0.272)	15.59 (3.071)	179 (81.4)	63 (17.2)	69 (20.3)	28.82 (97.32)

MAXIMUM POWER IN SELECTED GEARS

55.52 (41.40)	7245 (32.23)	2.87 (4.63)	2638	14.93	5th (I-4) Gear			181 (82.5)	60 (15.6)	69 (20.6)	29.00 (97.93)
59.32 (44.23)	6595 (29.34)	3.37 (5.43)	2499	12.21	6th (II-2) Gear			185 (84.7)	65 (18.3)	71 (21.7)	28.84 (97.39)
60.20 (44.89)	5238 (23.30)	4.31 (6.94)	2500	8.45	7th (II-3) Gear			185 (84.7)	65 (18.3)	71 (21.7)	28.84 (97.39)
62.73 (46.77)	4297 (19.11)	5.47 (8.81)	2499	6.86	8th (III-1) Gear			185 (85.0)	60 (15.6)	68 (20.0)	29.00 (97.93)
60.81 (45.35)	3195 (14.21)	7.14 (11.49)	2503	4.68	9th (II-4) Gear			184 (84.2)	64 (17.8)	70 (21.1)	28.83 (97.35)
61.50 (45.86)	2650 (11.79)	8.70 (14.01)	2501	3.80	10th (III-2) Gear			184 (84.4)	64 (17.8)	70 (21.1)	28.83 (97.35)

Department of Agricultural Engineering

Dates of Test: October 1 to 11, 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 2.793 gal (10.571 l) Drained from motor 2.364 gal (8.947 l) Transmission and final drive lubricant API 303 hydraulic fluid Total time engine was operated 43.5 hours.

ENGINE: Make Fiat/IVECO Diesel Type four cylinder vertical Serial No. 8045.05*205-003169* Crankshaft lengthwise Rated rpm 2500 Bore and stroke 4.094" × 4.527" (104 mm × 115 mm) Compression ratio 17 to 1 Displacement 238.5 cu in (3908 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements Oil filter one full flow cartridge Fuel filter two paper elements Muffler vertical Cooling medium temperature control one thermostat.

CHASSIS: Type front wheel assist Serial No. 80-66DT/I*656641* Tread width rear 59.1" (1500 mm) to 78.7" (2000 mm) front 60.2" (1530 mm) to 77" (1956 mm) Wheel base 88.5" (2248 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 34.0" (863 mm) Vertical distance above roadway 36.5" (927 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 1.1 (1.8) second 1.7 (2.7) third 2.0 (3.2) fourth 2.5 (4.0) fifth 3.3 (5.3) sixth 3.9 (6.3) seventh 4.8 (7.7) eighth 5.9 (9.5) ninth 7.6 (12.2) tenth 9.1 (14.6) eleventh 11.1 (17.9) twelfth 17.7 (28.5) reverse 1.1 (1.8), 1.7 (2.7), 2.0 (3.2), 2.5 (4.0), 3.3 (5.3), 3.9 (6.3), 4.8 (7.7), 5.9 (9.5), 7.6 (12.2), 9.1 (14.6), 11.1 (17.9), 17.7 (28.5) Clutch dry disc operated by foot pedal Brakes wet disc operated by two foot pedals which can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 159" (4.04 m) left 159" (4.04 m) (on concrete surface without brake) right 190" (4.83 m) left 190" (4.83 m) Turning space diameter (on concrete surface with brake applied) right 330" (8.38 m) left 330" (8.38 m) (on concrete surface without brake) right 392" (9.96 m) left 392" (9.96 m) Power take-off 540 rpm at 2198 engine rpm and 1000 rpm at 2381 engine rpm Unladen tractor mass 6535 lbs (2964 kg).

LUGGING ABILITY IN 8th (III-1) GEAR

Crankshaft Speed rpm	2499	2252	2001	1746	1484	1235	993
Pull—lbs (kN)	4297 (19.11)	4476 (19.91)	4600 (20.46)	4843 (21.54)	4776 (21.24)	4868 (21.65)	4029 (17.92)
Increase in Pull %	0	4	7	13	11	13	-6
Power—Hp (kW)	62.73 (46.77)	58.72 (43.79)	53.48 (39.88)	48.90 (36.46)	41.01 (30.58)	34.72 (25.89)	23.47 (17.50)
Speed—Mph (km/h)	5.47 (8.81)	4.92 (7.92)	4.36 (7.02)	3.79 (6.09)	3.22 (5.18)	2.67 (4.30)	2.18 (3.52)
Slip %	6.86	6.99	7.25	7.63	7.63	7.76	6.47

Front Wheel Drive

TRACTOR SOUND LEVEL WITHOUT CAB Engaged dB(A) Disengaged dB(A)

Maximum Available Power—Two Hours	93.5	93.5
75% of Pull at Maximum Power—Ten Hours		94.0
50% of Pull at Maximum Power—Two Hours		95.5
50% of Pull at Reduced Engine Speed—Two Hours		90.0
Bystander in 12th (III-4) gear		89.0

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 8th (III-1) Gear											
62.21 (46.39)	4173 (18.56)	5.59 (9.00)	2501	5.91	4.180 (15.825)	0.469 (0.285)	14.88 (2.931)	183 (83.9)	59 (15.0)	62 (16.7)	29.00 (97.93)

MAXIMUM POWER IN SELECTED GEARS

47.83 (35.67)	7986 (35.52)	2.25 (3.62)	2619	14.86	4th (II-1) Gear			178 (80.8)	59 (15.0)	66 (18.9)	29.00 (97.93)
62.83 (46.85)	4217 (18.76)	5.59 (8.99)	2499	5.81	8th (III-1) Gear			183 (83.9)	59 (15.0)	62 (16.7)	29.00 (97.93)

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 163°F (73.0°C). Six gears were chosen between 15% slip and 10 mph (16.1 km/h). During final inspection, several vertical marks were found on the wall of the front cylinder.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1532**, December 21, 1984.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

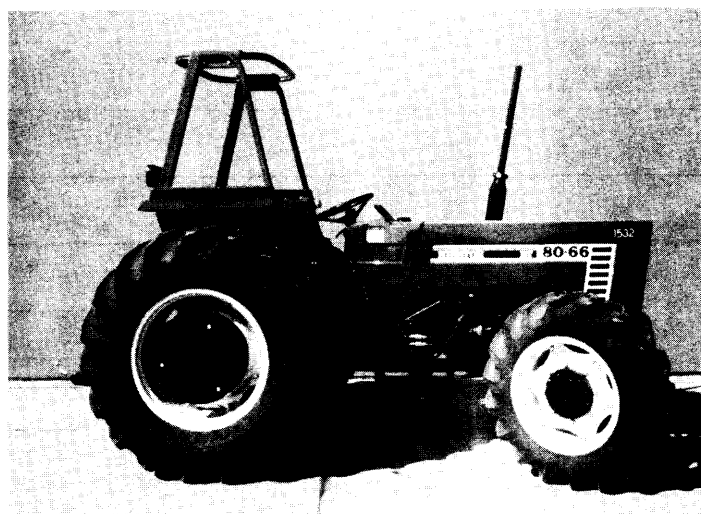
W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 18.4-30; 6; 16 (110)	Two 18.4-30; 6; 16 (110)
Ballast	—Liquid (each)	690 lb (313 kg)	None
	—Cast Iron (each)	610 lb (277 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 12.4-24; 6; 24 (165)	Two 12.4-24; 6; 24 (165)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	42 lb (19 kg)	None
Height of Drawbar		20 in (510 mm)	20 in (510 mm)
Static Weight with Operator —Rear		6805 lb (3087 kg)	4205 lb (1907 kg)
	—Front	2595 lb (1177 kg)	2510 lb (1139 kg)
	—Total	9400 lb (4264 kg)	6715 lb (3046 kg)



Hesston 80-66DT Diesel

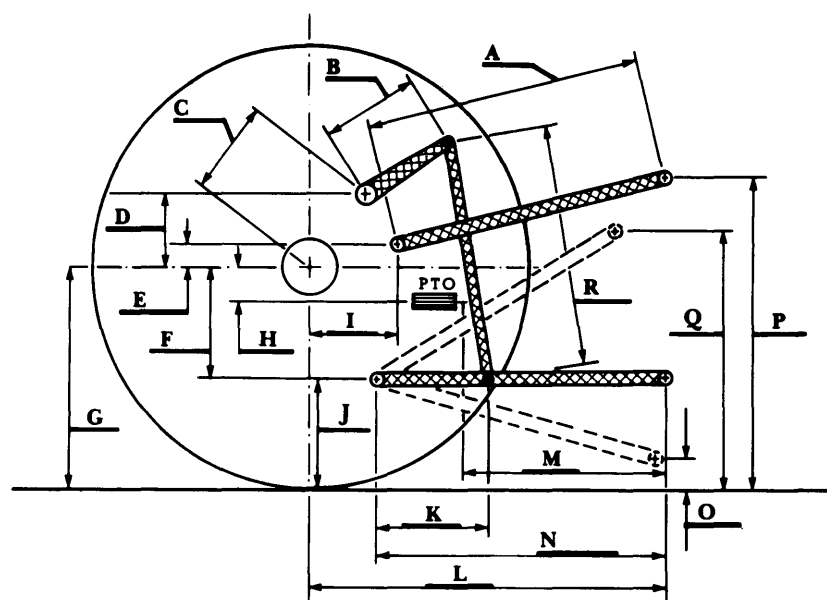
THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi (kPa)	2525 ***	17410
Location	remote	
Hydraulic oil temperature °F (°C)	184	84
Location	pump inlet	
	Maximum Lift Capacity	Lift Capacity for Transport
QUICK ATTACH CATEGORY	no II	*not measured
LOAD lbs (kg)	5194	2356
TIME sec	7.04	
HITCH POINT MOVEMENT in (mm)		
Lowest position	14.6	371
Top of timed range	**36.6	930
Highest position	36.6	930
LOAD CG MOVEMENT in (mm)		
Lowest position	13.4	341
Top of timed range	36.9	937
Highest position	36.8	933

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

**The observed power range 22" (560 mm) does not meet the minimum power range 24 in. (610 mm) specified by ASAE Standard S217.10.

***The observed maximum pressure was outside the range specified by the manufacturer 2600-2800 psi (17950-19300 kPa).



Hitch Dimensions as Tested — No Load

	inch	mm
A	32.4	822
B	10.0	255
C	13.8	350
D	11.7	297
E	10.4	264
F	8.1	206
G	27.9	708
H	0.6	15
I	6.3	160
J	19.8	502
K	21.3	541
L	38.9	989
M	27.0	686
N	36.7	932
O	8.0	203
P	38.8	984
Q	32.4	822
R	25.8	654

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