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Test 1566: Versatile 836 Manual Diesel 15-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1566—VERSATILE 836 MANUAL DIESEL 15 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—1008 rpm)									
192.54 (143.58)	2100	10.870 (41.146)	0.394 (0.240)	17.71 (3.490)	180 (82.3)	65 (18.3)	75 (23.8)	28.97 (97.82)	
Reduced Engine Speed — One Hour (PTO Speed—862 rpm)									
197.18 (147.03)	1799	10.416 (39.427)	0.369 (0.224)	18.93 (3.730)	182 (83.2)	66 (19.0)	75 (24.1)	28.83 (97.34)	
VARYING POWER AND FUEL CONSUMPTION — Two Hours									
170.54 (127.17)	2187	10.196 (38.597)	0.417 (0.254)	16.73 (3.295)	179 (81.7)	67 (19.2)	75 (23.6)	..... .....
0.00 (0.00)	2328	3.284 (12.432)	..... .....	..... .....	177 (80.6)	66 (18.9)	75 (23.9)	..... .....
88.19 (65.76)	2262	7.093 (26.849)	0.561 (0.341)	12.43 (2.449)	178 (81.1)	67 (19.4)	76 (24.2)	..... .....
192.77 (143.75)	2101	11.181 (42.323)	0.405 (0.246)	17.24 (3.396)	181 (82.5)	68 (19.7)	77 (25.0)	..... .....
44.82 (33.42)	2289	4.879 (18.469)	0.760 (0.462)	9.19 (1.810)	178 (80.8)	67 (19.4)	75 (23.6)	..... .....
130.92 (97.62)	2235	8.825 (33.406)	0.470 (0.286)	14.83 (2.922)	179 (81.7)	68 (19.7)	75 (23.9)	..... .....
Av Av	104.54 (77.95)	2234	7.576 (28.679)	0.506 (0.308)	13.80 (2.718)	179 (81.4)	67 (19.4)	75 (24.0)	28.92 (97.65)

DRAWBAR PERFORMANCE AT 2100 RPM

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 9th (2-4) Gear											
166.62 (124.25)	11276 (50.16)	5.54 (8.92)	2099	3.23	10.689 (40.463)	0.448 (0.272)	15.59 (3.071)	183 (83.6)	59 (14.7)	72 (22.2)	28.85 (97.42)
75% of Pull at Maximum Power — Ten Hours 9th (2-4) Gear											
134.90 (100.60)	8627 (38.38)	5.86 (9.44)	2202	2.47	9.560 (36.189)	0.495 (0.301)	14.11 (2.780)	183 (83.9)	57 (13.7)	69 (20.6)	29.01 (97.96)
50% of Pull at Maximum Power — Two Hours 9th (2-4) Gear											
92.57 (69.03)	5752 (25.59)	6.03 (9.71)	2247	1.69	7.723 (29.235)	0.582 (0.354)	11.99 (2.361)	183 (83.9)	60 (15.3)	75 (23.9)	28.97 (97.83)
50% of Pull at Reduced Engine Speed — Two Hours 12th (3-2) Gear											
92.67 (69.10)	5752 (25.59)	6.04 (9.72)	1311	1.69	5.724 (21.669)	0.431 (0.262)	16.19 (3.189)	186 (85.3)	61 (15.8)	78 (25.3)	28.96 (97.79)

MAXIMUM POWER IN SELECTED GEARS

137.28 (102.37)	24123 (107.30)	2.13 (3.43)	2172	14.78	3rd (1-3) Gear			182 (83.3)	50 (10.0)	54 (12.2)	28.97 (97.83)
150.15 (111.97)	23774 (105.75)	2.37 (3.81)	2101	14.29	4th (1-4) Gear			183 (83.9)	54 (12.2)	60 (15.6)	28.99 (97.89)
161.31 (120.29)	20016 (89.03)	3.02 (4.86)	2100	8.02	5th (1-5) Gear			182 (83.1)	60 (15.6)	75 (23.9)	28.84 (97.39)
164.96 (123.01)	17912 (79.67)	3.45 (5.56)	2100	6.31	6th (2-1) Gear			182 (83.3)	60 (15.6)	75 (23.9)	28.84 (97.39)
169.78 (126.61)	15883 (70.65)	4.01 (6.45)	2097	5.20	7th (2-2) Gear			183 (83.6)	60 (15.6)	75 (23.9)	28.85 (97.42)
170.56 (127.19)	13245 (58.92)	4.83 (7.77)	2101	3.92	8th (2-3) Gear			183 (83.9)	60 (15.6)	74 (23.3)	28.86 (97.46)
170.08 (126.83)	11503 (51.17)	5.54 (8.92)	2100	3.23	9th (2-4) Gear			183 (83.9)	59 (15.0)	73 (22.8)	28.85 (97.42)
166.57 (124.21)	9428 (41.94)	6.63 (10.66)	2100	2.60	10th (2-5) Gear			184 (84.2)	60 (15.6)	74 (23.3)	28.86 (97.46)
166.71 (124.32)	7434 (33.07)	8.41 (13.53)	2101	1.89	11th (3-1) Gear			183 (83.9)	60 (15.6)	73 (22.8)	28.85 (97.42)

Department of Agricultural Engineering

Dates of Test: May 16 to 28, 1985

Manufacturer: VERSATILE FARM EQUIPMENT COMPANY, 1260 Clarence Avenue, Winnipeg, Manitoba Canada R3T 1T3

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 48.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F (15/15°C)** 0.8382 **Fuel weight** 6.979 lbs/gal (0.836 kg/l) **Oil SAE 15W-40 API service classification** SE, SF, CC, CD **To motor** 6.423 gal (24.315 l) **Drained from motor** 5.921 gal (22.414 l) **Transmission and hydraulic lubricant** Versatile HyGear 23 or equivalent **Final drive lubricant** SAE 85W140 **Total time engine was operated** 47.5 hours.

ENGINE: Make Cummins Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 34515051 **Crankshaft** lengthwise **Rated rpm** 1750 to 2100 **Bore and stroke** 4.921" × 5.354" (125 mm × 136 mm) **Compression ratio** 16.0 to 1 **Displacement** 611 cu in (10010 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge and one bypass cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium** temperature control one thermostat.

CHASSIS: **Type** four wheel drive with duals **Serial No.** 836 85 215121 **Tread width** rear 62" (1575 mm) to 120.1" (3050 mm) front 62" (1575 mm) to 120.1" (3050 mm) **Wheel base** 129.9" (3300 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 74.3" (1887 mm) Vertical distance above roadway 41" (1041 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 1.8 (2.8) second 2.0 (3.3) third 2.3 (3.7) fourth 2.8 (4.4) fifth 3.3 (5.3) sixth 3.7 (5.9) seventh 4.2 (6.8) eighth 5.0 (8.1) ninth 5.7 (9.2) tenth 6.8 (10.9) eleventh 8.6 (13.8) twelfth 9.8 (15.8) thirteenth 11.7 (18.8) fourteenth 13.3 (21.4) fifteenth 15.8 (25.4) reverse 2.7 (4.4), 3.1 (5.0), 3.7 (6.0), 4.2 (6.8), 5.0 (8.1) **Clutch** multiple wet disc operated by foot pedal **Brakes** caliper disc hydraulically actuated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 236" (5.99 m) left 236" (5.99 m) **Turning space diameter** (on concrete surface without brake) right 490" (12.45 m) left 490" (12.45 m) **Power take-off** 1008 rpm at 2100 engine rpm **Unladen tractor mass** 24480 lb (11104 kg).

LUGGING ABILITY IN 9th (2-4) GEAR

Crankshaft Speed rpm	2100	1886	1677	1471	1254	1050
Pull—lbs (kN)	11503 (51.17)	13329 (59.29)	14523 (64.60)	15743 (70.03)	16513 (73.45)	15936 (70.89)
Increase in Pull %	0	16	26	37	44	39
Power—Hp (kW)	170.08 (126.83)	175.81 (131.10)	169.33 (126.27)	160.04 (119.34)	142.30 (106.12)	115.21 (85.91)
Speed—Mph (km/h)	5.54 (8.92)	4.95 (7.96)	4.37 (7.04)	3.81 (6.14)	3.23 (5.20)	2.71 (4.36)
Slip %	3.23	4.07	4.38	4.98	5.72	5.28

TRACTOR SOUND LEVEL WITH CAB	1750 RPM	1900 RPM	2100 RPM
	dB(A)	dB(A)	dB(A)
Maximum Available Power—Two Hours	77.0	79.0	84.0
75% of Pull at Maximum Power—Ten Hours			80.0
50% of Pull at Maximum Power—Two Hours			81.0
50% of Pull at Reduced Engine Speed—Two Hours			74.0
Bystander in 15th (3-5) gear			92.0

DRAWBAR PERFORMANCE AT 1900 RPM

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. °F (°C)			Barom. inch Hg (kPa)
								Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power — Two Hours 9th (2-4) Gear											
172.66 (128.75)	13006 (57.85)	4.98 (8.01)	1900	4.11	10.496 (39.731)	0.424 (0.258)	16.45 (3.241)	184 (84.4)	57 (13.9)	67 (19.4)	28.99 (97.89)

MAXIMUM POWER IN SELECTED GEARS

175.49 (130.87)	15205 (67.63)	4.33 (6.97)	1900	4.83	8th (2-3) Gear	183 (83.6)	60 (15.6)	74 (23.3)	28.86 (97.46)
175.81 (131.10)	13237 (58.88)	4.98 (8.02)	1898	3.92	9th (2-4) Gear	183 (83.6)	59 (15.0)	73 (22.8)	28.85 (97.42)

DRAWBAR PERFORMANCE AT 1750 RPM

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 9th (2-4) Gear											
169.34 (126.28)	13901 (61.83)	4.57 (7.35)	1749	4.26	10.023 (37.941)	0.413 (0.251)	16.90 (3.328)	186 (85.3)	59 (15.0)	73 (22.8)	29.00 (97.91)

MAXIMUM POWER IN SELECTED GEARS

170.62 (127.23)	16152 (71.85)	3.96 (6.37)	1748	5.35	8th (2-3) Gear	183 (83.6)	60 (15.6)	74 (23.3)	28.85 (97.42)
171.76 (128.08)	14084 (62.65)	4.57 (7.36)	1750	4.22	9th (2-4) Gear	183 (83.9)	59 (15.0)	73 (22.8)	28.85 (97.42)

TIRES, BALLAST AND WEIGHT

Rear Tires

—No., size, ply & psi (kPa)

Ballast

—Liquid (each inner)

—Cast Iron (each)

Front Tires

—No., size, ply & psi (kPa)

Ballast

—Liquid (each inner)

—Cast Iron (each)

Height of Drawbar

Static Weight with Operator—Rear

—Front

—Total

With Ballast

Four 18.4-38; 8; inner

14 (95) outer 12 (85)

305 lb (138 kg)

None

Four 18.4-38; 8; inner

14 (95) outer 12 (85)

345 lb (157 kg)

None

18 in (455 mm)

11170 lb (5067 kg)

14790 lb (6709 kg)

25960 lb (11776 kg)

Without Ballast

Four 18.4-38; 8; inner

14 (95) outer 12 (85)

None

None

Four 18.4-38; 8; inner

14 (95) outer 12 (85)

None

None

18 in (455 mm)

10560 lb (4790 kg)

14100 lb (6396 kg)

24660 lb (11186 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 inlet was maintained at 121°F (49.5°C). Nine gears were chosen between 15% slip and 10 mph (16.1 km/h). During the drawbar tests, the alternator belt guard bracket supports broke. A considerable amount of oil leaked from the valve block during the hydraulic lift test.

We, the undersigned, certify that this is as true and correct report of official Tractor Test No. 1566, June 21, 1985.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

L. L. BASHFORD

T. L. THOMPSON

Board of Tractor Test Engineers

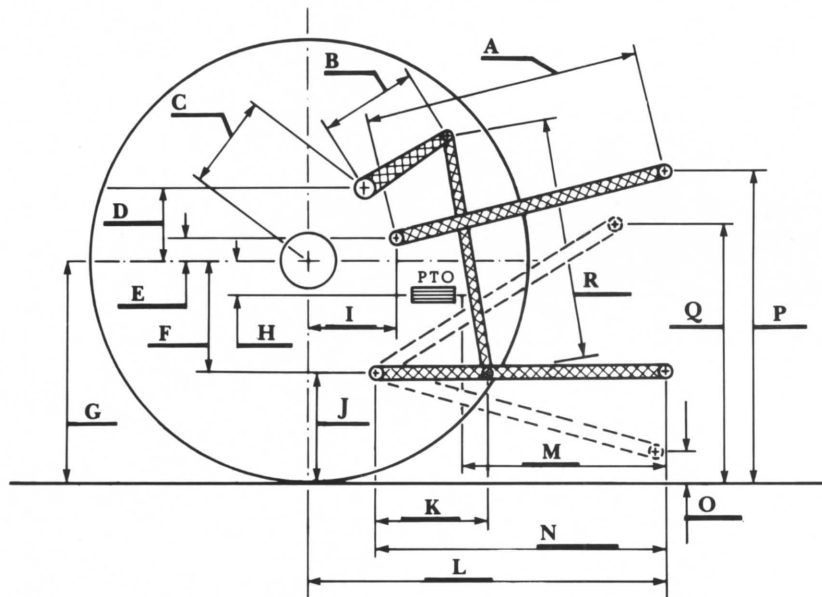
THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi (kPa)	** 2550	(17580)	
Location	remote outlet		
Hydraulic oil temperature °F (°C)	132	(56)	
Location	pump inlet		
	Maximum Lift Capacity		Lift Capacity for Transport
QUICK ATTACH	yes		
CATEGORY	IV		*not measured
LOAD lbs (kg)	*** 12744	(5781)	
TIME sec	4.13		
HITCH POINT MOVEMENT in (mm)			
Lowest position	13.8	(351)	
Top of timed range	43.8	(1113)	
Highest position	43.9	(1115)	
LOAD CG MOVEMENT in (mm)			
Lowest position	13.2	(335)	
Top of timed range	50.1	(1273)	
Highest position	50.4	(1280)	

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

**The observed maximum pressure was outside the range specified by the manufacturer, 2400-2500 psi (16550-17240 kPa).

***The manufacturer's claimed capacity was 21700 lbs (9840 kg).



Hitch Dimensions as Tested — No Load

	inch	mm
A	27.4	695
B	18.6	472
C	20.3	516
D	19.0	483
E	12.6	319
F	10.4	263
G	31.4	798
H	1.7	44
I	25.7	652
J	21.0	533
K	25.0	635
L	53.4	1356
L'	59.9	1521
M	27.9	708
N	43.0	1092
O	8.0	203
P	48.0	1219
Q	42.0	1067
R	32.6	829
L' to end of quick attach		



Versatile 836 Manual Diesel