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Test 1568: Versatile 856 Powershift Diesel 12-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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NEBRASKA TRACTOR TEST 1568—VERSATILE 856 POWERSHIFT DIESEL 12 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—997 rpm)								
209.28 (156.06)	2101	12.139 (45.951)	0.405 (0.246)	17.24 (3.397)	182 (83.5)	65 (18.3)	75 (23.6)	28.73 (97.02)
Reduced Engine Speed — One hour (PTO Speed—851 rpm)								
208.33 (155.36)	1793	11.271 (42.666)	0.378 (0.230)	18.48 (3.642)	183 (84.0)	64 (17.7)	75 (24.1)	28.70 (96.92)
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
186.13 (138.79)	2198	11.479 (43.452)	0.430 (0.262)	16.21 (3.194)	180 (82.2)	63 (17.2)	76 (24.4)	.....
0.00 (0.00)	2345	3.856 (14.598)	.....	.....	174 (78.9)	64 (17.8)	75 (23.6)	.....
96.54 (71.99)	2280	8.095 (30.645)	0.585 (0.356)	11.93 (2.349)	177 (80.6)	64 (17.5)	77 (24.7)	.....
210.26 (156.79)	2100	12.446 (47.114)	0.413 (0.251)	16.89 (3.328)	183 (83.9)	65 (18.1)	76 (24.4)	.....
48.77 (36.37)	2310	5.744 (21.743)	0.822 (0.500)	8.49 (1.673)	175 (79.4)	65 (18.1)	74 (23.3)	.....
142.37 (106.17)	2243	10.112 (38.277)	0.496 (0.301)	14.08 (2.774)	179 (81.4)	66 (18.9)	76 (24.2)	.....
Av 114.01 (85.02)	2246	8.622 (32.638)	0.528 (0.321)	13.22 (2.605)	178 (81.1)	64 (17.9)	75 (24.1)	28.69 (96.88)

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 7th Gear											
182.42 (136.03)	11638 (51.77)	5.88 (9.46)	2101	2.83	11.886 (44.995)	0.455 (0.277)	15.35 (3.023)	181 (82.8)	55 (12.5)	63 (16.9)	28.83 (97.35)
75% of Pull at Maximum Power — Ten Hours 7th Gear											
147.53 (110.02)	8850 (39.37)	6.25 (10.06)	2221	2.24	10.854 (41.087)	0.513 (0.312)	13.59 (2.678)	181 (82.7)	54 (12.0)	55 (13.0)	28.54 (96.38)
50% of Pull at Maximum Power — Two Hours 7th Gear											
100.93 (75.26)	5900 (26.24)	6.42 (10.32)	2268	1.74	8.856 (33.525)	0.612 (0.372)	11.40 (2.245)	178 (81.1)	53 (11.7)	54 (11.9)	28.74 (97.03)
50% of Pull at Reduced Engine Speed — Two Hours 9th Gear											
101.01 (75.32)	5901 (26.25)	6.42 (10.33)	1519	1.78	6.915 (26.175)	0.478 (0.291)	14.61 (2.878)	180 (82.2)	54 (11.9)	55 (12.8)	28.67 (96.80)

MAXIMUM POWER IN SELECTED GEARS

156.65 (116.81)	26479 (117.78)	2.22 (3.57)	2176	14.76	2nd Gear			179 (81.7)	53 (11.7)	58 (14.4)	28.92 (97.66)
175.49 (130.87)	23288 (103.59)	2.83 (4.55)	2098	7.86	3rd Gear			180 (82.2)	54 (12.2)	60 (15.6)	28.95 (97.76)
183.55 (136.87)	19406 (86.32)	3.55 (5.71)	2099	5.26	4th Gear			180 (82.2)	50 (10.0)	56 (13.3)	28.82 (97.32)
184.06 (137.26)	15711 (69.88)	4.39 (7.07)	2099	3.98	5th Gear			181 (82.5)	50 (10.0)	56 (13.3)	28.82 (97.32)
175.75 (131.06)	12141 (54.01)	5.43 (8.74)	2100	3.00	6th Gear			181 (82.5)	50 (10.0)	57 (13.9)	28.82 (97.32)
185.04 (137.99)	11810 (52.53)	5.88 (9.46)	2100	2.83	7th Gear			181 (82.5)	52 (11.1)	59 (15.0)	28.83 (97.35)
183.13 (136.56)	9522 (42.35)	7.21 (11.61)	2098	2.25	8th Gear			180 (82.2)	50 (10.0)	57 (13.9)	28.82 (97.32)
173.11 (129.09)	7321 (32.57)	8.87 (14.27)	2099	1.83	9th Gear			180 (82.2)	52 (11.1)	59 (15.0)	28.83 (97.35)

Department of Agricultural Engineering

Dates of Test: May 4 to 16, 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) 0.8381 Fuel weight 6.978 lbs/gal (0.836 kg/l) Oil SAE 15W-40 API service classification SE, SF, CC, CD To motor 6.691 gal (25.329 l) Drained from motor 5.249 gal (19.869 l) Transmission lubricant Mobil Delvac 1330 Final drive lubricant SAE 85W140 Total time engine was operated 50.5 hours.

ENGINE: Make Cummins Diesel Type six cylinder vertical with turbocharger and intercooler Serial No. 34514049 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 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. 856 85 221045 Tread width rear 72" (1830 mm) to 128" (3250 mm) front 72" (1830 mm) to 128" (3250 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 73.7" (1871 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 with full range operator controlled powershift Advertised speeds mph (km/h) first 2.0 (3.2) second 2.4 (3.9) third 3.0 (4.8) fourth 3.6 (5.8) fifth 4.4 (7.1) sixth 5.4 (8.7) seventh 5.8 (9.4) eighth 7.1 (11.5) ninth 8.7 (14.0) tenth 10.6 (17.1) eleventh 13.0 (20.9) twelfth 15.9 (25.6) reverse 2.3 (3.8), 2.9 (4.6), 3.5 (5.6) Clutch multiple wet disc hydraulically power actuated and operated by foot pedal Brakes caliper disc hydraulically operated by foot pedal Steering hydrostatic and articulated Turning radius (on concrete surface without brake) right 239" (6.07 m) left 239" (6.07 m) Turning space diameter (on concrete surface without brake) right 490" (12.45 m) left 490" (12.45 m) Power take-off 996 rpm at 2100 engine rpm Unladen tractor mass 24900 lb (11295 kg).

LUGGING ABILITY IN 7th GEAR

Crankshaft Speed rpm	2100	1887	1679	1465	1246	1047
Pull—lbs (kN)	11810 (52.53)	13394 (59.58)	14684 (65.32)	15726 (69.95)	16407 (72.98)	15457 (68.76)
Increase in Pull %	0	13	24	33	39	31
Power—Hp (kW)	185.04 (137.99)	187.72 (139.99)	182.51 (136.10)	169.98 (126.75)	150.43 (112.17)	119.33 (88.99)
Speed—Mph (km/h)	5.88 (9.46)	5.26 (8.46)	4.66 (7.50)	4.05 (6.52)	3.44 (5.53)	2.90 (4.66)
Slip %	2.83	3.33	3.65	3.82	4.14	3.82

TRACTOR SOUND LEVEL WITH CAB	1750 RPM dB(A)	1900 RPM dB(A)	2100 RPM dB(A)
Maximum Available Power—Two Hours	84.0	81.0	82.5
75% of Pull at Maximum Power—Ten Hours			79.0
50% of Pull at Maximum Power—Two Hours			80.5
50% of Pull at Reduced Engine Speed—Two Hours			76.5
Bystander in 12th gear			91.5

DRAWBAR PERFORMANCE AT 1900 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 7th Gear											
185.32 (138.20)	13130 (58.41)	5.29 (8.52)	1900	3.20	11.515 (43.588)	0.434 (0.264)	16.09 (3.170)	182 (83.3)	56 (13.3)	66 (18.6)	28.84 (97.37)

MAXIMUM POWER IN SELECTED GEARS

188.17 (140.32)	13351 (59.39)	5.29 (8.51)	1897	3.24	7th Gear	180 (82.2)	53 (11.7)	60 (15.6)	28.83 (97.35)
186.93 (139.40)	10762 (47.87)	6.51 (10.48)	1901	2.66	8th Gear	181 (82.8)	51 (10.6)	58 (14.4)	28.82 (97.32)

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 7th Gear											
181.22 (135.13)	13979 (62.18)	4.86 (7.82)	1749	3.33	11.063 (41.879)	0.426 (0.259)	16.38 (3.227)	183 (83.6)	56 (13.3)	67 (19.2)	28.84 (97.37)

MAXIMUM POWER IN SELECTED GEARS

183.73 (137.01)	14178 (63.07)	4.86 (7.82)	1749	3.57	7th Gear	183 (83.6)	56 (13.3)	66 (18.9)	28.83 (97.35)
184.22 (137.37)	11540 (51.33)	5.99 (9.63)	1750	2.75	8th Gear	182 (83.1)	51 (10.6)	58 (14.4)	28.83 (97.35)

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Four 20.8-38; 8; inner 14 (95) outer 12 (85)	Four 20.8-38; 8; inner 14 (95) outer 12 (85)
Ballast	—Liquid (each inner) —Cast Iron (each)	533 lb (242 kg) None	None None
Front Tires	—No., size, ply & psi (kPa)	Four 20.8-38; 8; inner 14 (95) outer 12 (85)	Four 20.8-38; 8; inner 14 (95) outer 12 (85)
Ballast	—Liquid (each inner) —Cast Iron (each)	927 lb (421 kg) None	None None
Height of Drawbar		19.5 in (495 mm)	19.5 in (495 mm)
Static Weight with Operator	—Rear —Front —Total	11925 lb (5409 kg) 16075 lb (7292 kg) 28000 lb (12701 kg)	10860 lb (4926 kg) 14220 lb (6450 kg) 25080 lb (11376 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 112°F (44.6°C). Eight gears were chosen between 15% slip and 10 mph (16.1 km/h). During the lift test, a retaining pin sheared. This did not affect the lift test.

We, the undersigned, certify that this is as true and correct report of official Tractor Test No. 1568, June 20, 1985.

LOUIS I. LEVITICUS
Engineer-in-Charge

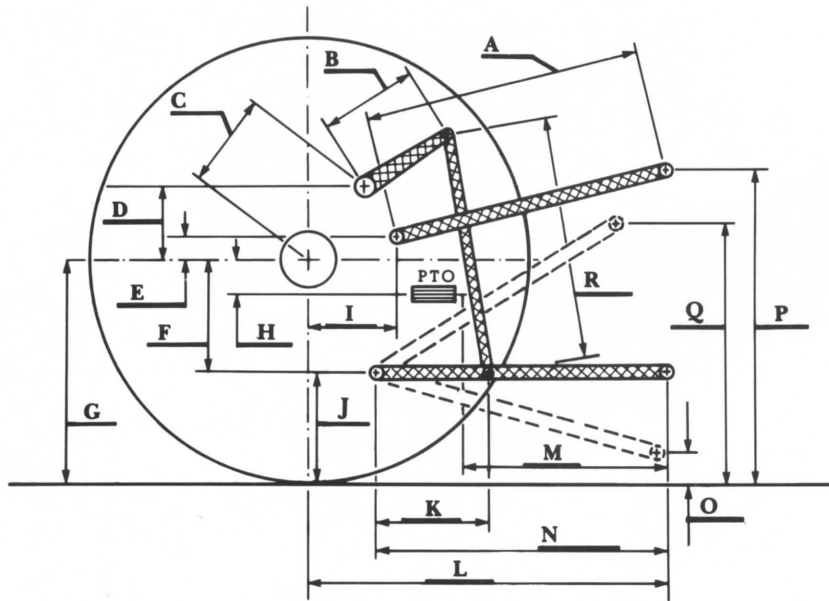
K. VON BARGEN
L. L. BASHFORD
T. L. THOMPSON

Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi (kPa)	** 2525 (17410)	
Location	remote outlet	
Hydraulic oil temperature °F (°C)	129 (54)	
Location	pump inlet	
	Maximum Lift Capacity	Lift Capacity for Transport
QUICK ATTACH	yes	
CATEGORY	IV	*not measured
LOAD lbs (kg)	*** 13036 (5913)	
TIME sec	4.08	
HITCH POINT MOVEMENT in (mm)		
Lowest position	13.8 (351)	
Top of timed range	43.8 (1113)	
Highest position	44.0 (1118)	
LOAD CG MOVEMENT in (mm)		
Lowest position	12.7 (323)	
Top of timed range	49.2 (1250)	
Highest position	49.6 (1260)	

*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	27.6	702
B	18.6	472
C	20.3	516
D	19.0	483
E	12.6	319
F	10.4	263
G	33.3	845
H	1.7	44
I	25.7	652
J	22.9	581
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	49.9	1267
Q	42.0	1067
R	33.4	848

L' to end of quick attach



Versatile 856 Powershift Diesel