10-30-1979

Test 1332: Versatile 875 Diesel 12-Speed

Nebraska Tractor Test Lab
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NEBRASKA TRACTOR TEST 1332 — VERSATILE 875 DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1008 rpm)								
247.16 *(184.31)*	2100	15.390 *(58.256)*	0.439 *(0.267)*	16.06 *(3.164)*	182 *(83.4)*	56 *(13.2)*	75 *(24.0)*	28.940 *(97.726)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
226.25 *(168.71)*	2263	15.366 *(58.165)*	0.479 *(0.291)*	14.72 *(2.901)*	180 *(82.5)*	56 *(13.3)*	75 *(23.9)*	....
0.00 *(0.00)*	2408	5.140 *(19.458)*	....	....	174 *(78.9)*	58 *(14.2)*	75 *(23.9)*	....
118.05 *(88.03)*	2357	11.378 *(43.069)*	0.680 *(0.414)*	10.38 *(2.044)*	176 *(80.0)*	57 *(13.9)*	76 *(24.2)*	....
247.20 *(184.34)*	2100	15.361 *(58.149)*	0.438 *(0.267)*	16.09 *(3.170)*	181 *(82.8)*	57 *(13.9)*	75 *(23.9)*	....
59.73 *(44.54)*	2386	7.725 *(29.244)*	0.913 *(0.555)*	7.73 *(1.523)*	174 *(78.9)*	57 *(13.9)*	75 *(23.9)*	....
174.73 *(130.30)*	2327	13.741 *(52.017)*	0.555 *(0.338)*	12.72 *(2.505)*	178 *(81.1)*	57 *(13.9)*	76 *(24.2)*	....
Av 137.66 ***Av (102.65)***	**2307**	**11.452** ***(43.350)***	**0.587** ***(0.357)***	**12.02** ***(2.368)***	**177** ***(80.7)***	**57** ***(13.8)***	**75** ***(24.0)***	**28.937** ***(97.715)***

DRAWBAR PERFORMANCE AT 2100 RPM

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)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 7th (2-3) Gear											
217.55 *(162.22)*	12386 *(55.10)*	6.59 *(10.60)*	2101	2.97	15.164 *(57.403)*	0.492 *(0.299)*	14.35 *(2.826)*	178 *(81.1)*	39 *(3.6)*	43 *(5.8)*	28.830 *(97.355)*
75% of Pull at Maximum Power—Ten Hours 7th (2-3) Gear											
184.02 *(137.23)*	9425 *(41.92)*	7.32 *(11.78)*	2316	2.25	14.690 *(55.607)*	0.565 *(0.344)*	12.53 *(2.468)*	176 *(79.8)*	30 *(-0.8)*	32 *(0.0)*	28.778 *(97.179)*
50% of Pull at Maximum Power—Two Hours 7th (2-3) Gear											
126.56 *(94.38)*	6312 *(28.08)*	7.52 *(12.10)*	2360	1.49	12.239 *(46.328)*	0.684 *(0.416)*	10.34 *(2.037)*	177 *(80.3)*	27 *(-2.7)*	29 *(-1.6)*	28.800 *(97.253)*
50% of Pull at Reduced Engine Speed—Two Hours 11th (3-3) Gear											
126.55 *(94.37)*	6307 *(28.05)*	7.52 *(12.11)*	1214	1.53	7.982 *(30.217)*	0.446 *(0.272)*	15.85 *(3.123)*	176 *(80.0)*	32 *(0.0)*	36 *(2.2)*	28.765 *(97.135)*

MAXIMUM POWER IN SELECTED GEARS

197.74 *(147.46)*	26795 *(119.19)*	2.77 *(4.45)*	2100	14.97	2nd (1-2) Gear	177 *(80.6)*	40 *(4.4)*	47 *(8.3)*	29.110 *(98.300)*
214.79 *(160.17)*	23364 *(103.93)*	3.45 *(5.55)*	2100	7.83	3rd (1-3) Gear	178 *(80.8)*	39 *(3.9)*	44 *(6.7)*	28.870 *(97.490)*
218.82 *(163.18)*	19963 *(88.80)*	4.11 *(6.62)*	2101	5.60	4th (1-4) Gear	178 *(80.8)*	39 *(3.9)*	45 *(7.2)*	28.880 *(97.523)*
221.66 *(165.30)*	17092 *(76.03)*	4.86 *(7.83)*	2100	4.32	5th (2-1) Gear	178 *(80.8)*	38 *(3.3)*	45 *(7.2)*	28.880 *(97.523)*
220.97 *(164.78)*	14552 *(64.73)*	5.69 *(9.16)*	2100	3.59	6th (2-2) Gear	178 *(80.8)*	34 *(1.1)*	44 *(6.7)*	28.910 *(97.625)*
221.00 *(164.80)*	12569 *(55.91)*	6.59 *(10.61)*	2100	3.01	7th (2-3) Gear	177 *(80.3)*	36 *(2.2)*	40 *(4.4)*	28.970 *(97.827)*
220.38 *(164.34)*	10733 *(47.74)*	7.70 *(12.39)*	2100	2.42	8th (2-4) Gear	178 *(80.8)*	34 *(1.1)*	44 *(6.7)*	28.890 *(97.557)*
216.15 *(161.18)*	8362 *(37.20)*	9.69 *(15.60)*	2099	1.92	9th (3-1) Gear	177 *(80.6)*	34 *(1.1)*	44 *(6.7)*	28.880 *(97.523)*

Department of Agricultural Engineering

Dates of Test: October 30 to November 13, 1979

MANUFACTURER: VERSATILE MANUFACTURING CO., 1260 Clarence Avenue, Winnipeg, Manitoba R3T 1T3

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8474 **Fuel weight** 7.056 lbs/gal *(0.846 kg/l)* **Oil SAE** 30 **API service classification** SB/SE-CA/CD **To motor** 9.850 gal *(37.282 l)* **Drained from motor** 6.145 gal *(23.259 l)* **Transmission and hydraulic lubricant** Esso Hydraul 56 or equivalent **Final drive lubricant** SAE 90 **Total time engine was operated** 53.5 hours

ENGINE Make Cummins Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** 10866155 **Crankshaft** lengthwise **Rated rpm** 1750 to 2100 **Bore and stroke** 5.5″ × 6.0″ *(139.7 mm × 152.4 mm)* **Compression ratio** 14.1 to 1 **Displacement** 855 cu in *(14013 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two cartridges **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type Four-wheel drive with duals **Serial No.** 875 80 054398 **Tread width** rear 72″ *(1829 mm)* to 122″ *(3099 mm)* front 72″ *(1829 mm)* to 122″ *(3099 mm)* **Wheel base** 130″ *(3302 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 80″ *(2032 mm)* Vertical distance above roadway 42″ *(1067 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 2.7 *(4.3)* second 3.1 *(5.0)* third 3.6 *(5.8)* fourth 4.1 *(6.6)* fifth 4.8 *(7.7)* sixth 5.6 *(9.0)* seventh 6.5 *(10.5)* eighth 7.5 *(12.1)* ninth 9.4 *(15.1)* tenth 10.9 *(17.5)* eleventh 12.6 *(20.3)* twelfth 14.6 *(23.5)* reverse 3.5 *(5.6)*, 4.0 *(6.4)*, 4.6 *(7.4)*, 5.4 *(8.7)* **Clutch** two dry discs operated by foot pedal **Brakes** dual caliper disc operated hydraulically by foot pedal and mechanically by hand lever **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** 1008 rpm at 2100 engine rpm.

LUGGING ABILITY IN 7th (2-3) GEAR

Crankshaft Speed rpm	2100	1895	1684	1469	1259	1052
Pull—lbs *(kN)*	12569 *(55.91)*	14926 *(66.39)*	17276 *(76.85)*	18557 *(82.54)*	18428 *(81.97)*	17123 *(76.17)*
Increase in Pull %	0	19	37	48	47	36
Power—Hp *(kW)*	221.00 *(164.80)*	235.22 *(175.40)*	240.28 *(179.18)*	223.87 *(166.94)*	190.69 *(142.20)*	148.65 *(110.85)*
Speed—Mph *(km/h)*	6.59 *(10.61)*	5.91 *(9.51)*	5.22 *(8.39)*	4.52 *(7.28)*	3.88 *(6.25)*	3.26 *(5.24)*
Slip %	3.01	3.83	4.32	4.81	4.97	4.48

TRACTOR SOUND LEVEL WITH CAB	2100 RPM dB(A)	1900 RPM dB(A)	1750 RPM dB(A)
Maximum Available Power—Two Hours	82.0	81.5	82.0
75% of Pull at Maximum Power—Ten Hours	82.5	----	----
50% of Pull at Maximum Power—Two Hours	82.5	----	----
50% of Pull at Reduced Engine Speed—Two Hours	81.5	----	----
Bystander in 12th (3-4) gear	91.0	----	----

DRAWBAR PERFORMANCE AT 1750 RPM

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)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 7th (2-3) Gear											
239.78 *(178.80)*	16577 *(73.74)*	5.42 *(8.73)*	1751	4.20	14.562 *(55.123)*	0.429 *(0.261)*	16.47 *(3.244)*	178 *(81.1)*	36 *(2.2)*	41 *(5.0)*	28.660 *(96.781)*
MAXIMUM POWER IN SELECTED GEARS											
209.13 *(155.95)*	26579 *(118.23)*	2.95 *(4.75)*	1942	14.84	3rd (1-3) Gear			177 *(80.6)*	38 *(3.3)*	44 *(6.7)*	29.110 *(98.300)*
220.91 *(164.73)*	26226 *(116.66)*	3.16 *(5.08)*	1751	12.81	4th (1-4) Gear			178 *(80.8)*	39 *(3.9)*	46 *(7.8)*	29.110 *(98.300)*
231.96 *(172.97)*	22016 *(97.93)*	3.95 *(6.36)*	1752	6.77	5th (2-1) Gear			179 *(81.4)*	39 *(3.9)*	45 *(7.2)*	28.880 *(97.523)*
238.19 *(177.62)*	19113 *(85.02)*	4.67 *(7.52)*	1752	5.21	6th (2-2) Gear			178 *(81.1)*	34 *(1.1)*	44 *(6.7)*	28.900 *(97.591)*
240.98 *(179.70)*	16652 *(74.07)*	5.43 *(8.73)*	1750	4.16	7th (2-3) Gear			178 *(81.1)*	35 *(1.7)*	43 *(6.1)*	28.940 *(97.726)*
242.03 *(180.48)*	14273 *(63.49)*	6.36 *(10.23)*	1752	3.42	8th (2-4) Gear			178 *(81.1)*	34 *(1.1)*	44 *(6.7)*	28.890 *(97.557)*
240.43 *(179.29)*	11223 *(49.92)*	8.03 *(12.93)*	1752	2.68	9th (3-1) Gear			178 *(81.1)*	36 *(2.2)*	45 *(7.2)*	28.880 *(97.523)*

DRAWBAR PERFORMANCE AT 1900 RPM

Maximum Available Power—Two Hours 7th (2-3) Gear											
234.34 *(174.75)*	14853 *(66.07)*	5.92 *(9.52)*	1899	3.63	14.810 *(56.062)*	0.446 *(0.271)*	15.82 *(3.117)*	178 *(81.1)*	35 *(1.7)*	40 *(4.4)*	28.685 *(96.865)*
MAXIMUM POWER IN SELECTED GEAR											
237.02 *(176.74)*	15028 *(66.85)*	5.91 *(9.52)*	1899	3.83	7th (2-3) Gear			177 *(80.6)*	35 *(1.7)*	40 *(4.4)*	28.690 *(96.882)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8-38; 8; inner 16 (110); outer 14 (95)	Four 20.8-38; 8; inner 16 (110); outer 14 (95)
Ballast	—Liquid (each inner)	920 lb *(417 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Four 20.8-38; 8; inner 16 (110); outer 14 (95)	Four 20.8-38; 8; inner 16 (110); outer 14 (95)
Ballast	—Liquid (each inner)	1160 lb *(526 kg)*	None
	—Cast Iron (each)	None	None
Height of drawbar		20 in *(510 mm)*	20 in *(510 mm)*
Static Weight with Operator—Rear		11740 lb *(5325 kg)*	9900 lb *(4491 kg)*
Front		17740 lb *(8047 kg)*	15420 lb *(6995 kg)*
Total		29480 lb *(13372 kg)*	25320 lb *(11486 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 code or official Nebraska test procedure. Temperature at injection pump was 142°F *(61.0°C)*. Eight 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 **1332.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

Versatile 875 Diesel

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