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Test 1416: Long 510 DTC Diesel 8-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1416 — LONG 510 DTC 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—600 rpm)								
49.35 (36.80)	2400	3.077 (11.648)	0.430 (0.261)	16.04 (3.159)	214 (101.1)	54 (12.3)	75 (24.0)	29.003 (97.940)
Standard Power Take-off Speed (540 rpm)—One Hour								
46.41 (34.61)	2160	2.818 (10.667)	0.418 (0.255)	16.47 (3.245)	214 (100.9)	55 (12.7)	75 (23.8)	28.985 (97.878)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
43.41 (32.37)	2484	2.668 (10.099)	0.424 (0.258)	16.27 (3.205)	202 (94.4)	55 (12.8)	76 (24.4)	..... .....
0.00 (0.00)	2504	0.792 (2.998)	..... .....	..... .....	168 (75.6)	55 (12.5)	75 (23.9)	..... .....
21.68 (16.17)	2478	1.619 (6.129)	0.515 (0.313)	13.39 (2.638)	173 (78.3)	54 (12.2)	74 (23.1)	..... .....
49.56 (36.96)	2400	3.138 (11.879)	0.436 (0.266)	15.79 (3.111)	204 (95.3)	56 (13.1)	76 (24.2)	..... .....
11.11 (8.28)	2544	1.210 (4.580)	0.751 (0.457)	9.18 (1.808)	169 (76.1)	55 (12.8)	75 (23.9)	..... .....
32.82 (24.47)	2505	2.129 (8.059)	0.447 (0.272)	15.42 (3.036)	179 (81.7)	55 (12.8)	75 (23.6)	..... .....
Av 26.43 Av (19.71)	2486	1.926 (7.291)	0.502 (0.306)	13.72 (2.703)	182 (83.6)	55 (12.7)	75 (23.8)	28.970 (97.827)

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 5th Gear											
40.93 (30.52)	3310 (14.72)	4.64 (7.46)	2400	7.72	2.991 (11.323)	0.504 (0.306)	13.68 (2.696)	183 (83.9)	48 (8.6)	59 (15.0)	29.065 (98.148)
75% of Pull at Maximum Power—Ten Hours 5th Gear											
33.23 (24.78)	2521 (11.21)	4.94 (7.96)	2510	5.94	2.498 (9.457)	0.518 (0.315)	13.30 (2.620)	168 (75.5)	32 (-0.3)	40 (4.2)	29.411 (99.317)
50% of Pull at Maximum Power—Two Hours 5th Gear											
22.88 (17.06)	1689 (7.51)	5.08 (8.18)	2528	3.98	1.958 (7.412)	0.590 (0.359)	11.69 (2.302)	167 (75.0)	34 (1.1)	40 (4.2)	29.110 (98.300)
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
22.87 (17.06)	1689 (7.51)	5.08 (8.17)	1679	4.01	1.632 (6.176)	0.492 (0.299)	14.02 (2.761)	168 (75.3)	42 (5.3)	50 (9.7)	29.095 (98.249)
MAXIMUM POWER IN SELECTED GEARS											
27.96 (20.85)	5635 (25.06)	1.86 (3.00)	2499	14.90	2nd Gear			169 (76.0)	52 (11.1)	63 (17.2)	28.900 (97.591)
38.87 (28.98)	5536 (24.62)	2.63 (4.24)	2400	14.33	3rd Gear			188 (86.7)	52 (11.1)	63 (17.2)	28.910 (97.625)
39.91 (29.76)	4193 (18.65)	3.57 (5.74)	2400	10.14	4th Gear			192 (88.9)	52 (11.1)	63 (17.2)	28.910 (97.625)
41.37 (30.85)	3354 (14.92)	4.63 (7.44)	2398	7.92	5th Gear			185 (85.0)	50 (10.0)	59 (15.0)	28.870 (97.490)
40.39 (30.12)	2108 (9.38)	7.18 (11.56)	2398	4.82	6th Gear			185 (85.0)	52 (11.1)	62 (16.7)	28.820 (97.321)

LUGGING ABILITY IN 5th GEAR

Crankshaft Speed rpm	2398	2161	1923	1689	1434	1195
Pull—lbs (kN)	3354 (14.92)	3506 (15.59)	3590 (15.97)	3674 (16.34)	3702 (16.47)	3532 (15.71)
Increase in Pull %	0	5	7	10	10	5
Power—Hp (kW)	41.37 (30.85)	38.72 (28.88)	35.20 (26.25)	31.55 (23.52)	26.95 (20.09)	21.52 (16.05)
Speed—Mph (km/h)	4.63 (7.44)	4.14 (6.67)	3.68 (5.92)	3.22 (5.18)	2.73 (4.39)	2.29 (3.68)
Slip %	7.92	8.47	8.69	8.91	8.91	8.69

Department of Agricultural Engineering

Dates of Test: October 29 to November 14, 1981

Manufacturer: UNIVERSAL TRACTOR BRA-SOV (UTB) Brasov, Romania

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8281 **Fuel weight** 6.895 lbs/gal (0.826 kg/l) **Oil** Long engine oil SAE 15W-40 **API service classification** SF-CD **To motor** 2.059 gal (7.795 l) **Drained from motor** 1.301 gal (4.924 l) **Transmission lubricant** Exxon torque fluid 56 or equiv. **Final drive lubricant** SAE 90 gearlube **Total time engine was operated** 60.5 hours

ENGINE: Make UTB diesel **Type** three cylinder vertical **Serial No.** D-115.050*003174* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.02" × 4.33" (102 mm × 110 mm) **Compression ratio** 17 to 1 **Displacement** 164.5 cu in (2696 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** oil bath with centrifugal precleaner **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.** 414764 **Tread width** rear 52.3" (1327 mm) to 76.3" (1937 mm) front 59.5" (1511 mm) **Wheel base** 75.2" (1910 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 33.9" (860 mm) Vertical distance above roadway 28.5" (724 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 1.4 (2.2) second 2.1 (3.4) third 3.1 (4.9) fourth 4.0 (6.4) fifth 5.0 (8.1) sixth 7.5 (12.1) seventh 11.0 (17.8) eighth 14.3 (22.9) reverse 2.0 (3.2), 7.2 (11.6) **Clutch** dual plate dry disc operated by foot pedal **Brakes** contracting band operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 161" (4.09 m) left 161" (4.09 m) (on concrete surface without brake) right 173" (4.39 m) left 173" (4.39 m) **Turning space diameter** (on concrete surface with brake applied) right 332" (8.43 m) left 332" (8.43 m) (on concrete surface without brake) right 356" (9.04 m) left 356" (9.04 m) **Power take-off** 540 rpm at 2160 engine rpm.

REPAIRS and ADJUSTMENTS: The fuel pump was replaced during preliminary PTO tests. The missing air baffles above radiator were installed during preliminary PTO test.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 171°F (77.2°C). Five gears were chosen

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	98.5	98.5
75% of Pull at Maximum Power—Ten Hours		97.0
50% of Pull at Maximum Power—Two Hours		95.5
50% of Pull at Reduced Engine Speed—Two Hours		92.0
Bystander in 8th gear		86.5

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

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 5th Gear											
40.01 (29.84)	3102 (13.80)	4.84 (7.78)	2399	6.58	3.064 (11.598)	0.528 (0.321)	13.06 (2.573)	183 (83.9)	47 (8.3)	58 (14.4)	29.085 (98.216)

MAXIMUM POWER IN SELECTED GEARS

33.32 (24.85)	6657 (29.61)	1.88 (3.02)	2449	14.89	2nd Gear			166 (74.4)	35 (1.7)	36 (2.2)	29.230 (98.705)
41.02 (30.59)	3180 (14.14)	4.84 (7.79)	2400	6.64	5th Gear			184 (84.4)	48 (8.9)	60 (15.6)	29.070 (98.165)

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires		Two 14.9-28; 6; 20 (140)	Two 14.9-28; 6; 20 (140)
Ballast	—No., size, ply & psi (kPa)	680 lb (308 kg)	None
	—Liquid (each)	838 lb (380 kg)	None
	—Cast Iron (each)		
Front Tires		Two 9.5-20; 6; 35 (240)	Two 9.5-20; 6; 35 (240)
Ballast	—No., size, ply & psi (kPa)	None	None
	—Liquid (each)	400 lb (181 kg)	None
	—Cast Iron (each)		
Height of Drawbar		18.5 in (470 mm)	18.5 in (470 mm)
Static Weight with Operator—Rear		5990 lb (2717 kg)	2955 lb (1340 kg)
	—Front	3110 lb (1411 kg)	2310 lb (1048 kg)
	—Total	9100 lb (4128 kg)	5265 lb (2388 kg)

between 15% slip and 10 mph (16.1 km/h). At the end of the tests, the instrument cluster supports were found to be broken.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1416.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers



Long 510 DTC Diesel