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Test 1415: Long 510 Diesel 8-Speed

Nebraska Tractor Test Lab
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NEBRASKA TRACTOR TEST 1415 — LONG 510 DIESEL 8 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—600 rpm)								
49.15 (36.65)	2400	3.242 (12.272)	0.455 (0.277)	15.16 (2.986)	205 (96.2)	58 (14.2)	75 (23.9)	29.043 (98.075)
Standard Power Take-off Speed (540 rpm)—One Hour								
46.91 (34.98)	2160	2.981 (11.284)	0.438 (0.267)	15.74 (3.100)	205 (96.1)	57 (13.7)	75 (23.9)	29.065 (98.148)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
42.55 (31.73)	2445	2.654 (10.046)	0.430 (0.262)	16.03 (3.158)	192 (88.6)	56 (13.1)	75 (23.6)	....
0.00 (0.00)	2531	0.818 (3.096)	....	....	174 (78.9)	56 (13.1)	75 (23.9)	....
21.68 (16.17)	2492	1.614 (6.110)	0.513 (0.312)	13.43 (2.646)	180 (82.2)	56 (13.1)	75 (23.6)	....
49.54 (36.94)	2400	3.281 (12.420)	0.457 (0.278)	15.10 (2.974)	201 (93.6)	56 (13.3)	76 (24.2)	....
10.93 (8.15)	2511	1.175 (4.448)	0.741 (0.451)	9.30 (1.832)	179 (81.4)	55 (12.8)	75 (23.9)	....
32.20 (24.01)	2466	2.093 (7.923)	0.448 (0.273)	15.38 (3.030)	182 (83.3)	55 (12.8)	76 (24.2)	....
Av 26.15	**2474**	**1.939**	**0.511**	**13.48**	**184**	**55**	**75**	**29.095**
Av (19.50)		***(7.340)***	***(0.311)***	***(2.657)***	***(84.7)***	***(13.0)***	***(23.9)***	***(98.249)***

DRAWBAR PERFORMANCE

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 5th Gear											
41.73 (31.12)	3046 (13.55)	5.14 (8.27)	2399	6.70	3.173 (12.010)	0.524 (0.319)	13.15 (2.591)	183 (83.6)	49 (9.2)	59 (15.0)	29.145 (98.418)
75% of Pull at Maximum Power—Ten Hours 5th Gear											
34.18 (25.49)	2369 (10.54)	5.41 (8.71)	2479	4.94	2.527 (9.566)	0.510 (0.310)	13.52 (2.664)	176 (79.9)	48 (8.8)	57 (13.8)	29.027 (98.020)
50% of Pull at Maximum Power—Two Hours 5th Gear											
23.53 (17.55)	1590 (7.07)	5.55 (8.93)	2505	3.55	1.922 (7.274)	0.563 (0.343)	12.24 (2.412)	173 (78.3)	46 (7.5)	51 (10.3)	29.000 (97.929)
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
23.45 (17.49)	1583 (7.04)	5.56 (8.94)	1666	3.46	1.632 (6.176)	0.480 (0.292)	14.37 (2.831)	173 (78.3)	51 (10.3)	60 (15.3)	28.955 (97.777)
MAXIMUM POWER IN SELECTED GEARS											
32.44 (24.19)	6040 (26.87)	2.01 (3.24)	2469	14.98	2nd Gear			171 (77.2)	40 (4.4)	43 (6.1)	28.990 (97.895)
40.81 (30.43)	5211 (23.18)	2.94 (4.73)	2398	12.84	3rd Gear			180 (81.9)	48 (8.9)	58 (14.4)	29.170 (98.503)
41.95 (31.28)	3971 (17.66)	3.96 (6.38)	2400	9.06	4th Gear			182 (83.1)	48 (8.9)	59 (15.0)	29.160 (98.469)
43.27 (32.26)	3154 (14.03)	5.14 (8.28)	2400	6.56	5th Gear			179 (81.7)	47 (8.3)	55 (12.8)	29.180 (98.536)
42.70 (31.84)	2018 (8.98)	7.93 (12.77)	2400	4.28	6th Gear			182 (83.3)	48 (8.9)	59 (15.0)	29.160 (98.469)

LUGGING ABILITY IN 5th GEAR

Crankshaft Speed rpm	2400	2163	1914	1685	1446	1194	956
Pull—lbs (kN)	3154 (14.03)	3340 (14.86)	3468 (15.43)	3572 (15.89)	3635 (16.17)	3635 (16.17)	3381 (15.04)
Increase in Pull %	0	6	10	13	15	15	7
Power—Hp (kW)	43.27 (32.26)	41.10 (30.65)	37.61 (28.05)	34.00 (25.35)	29.63 (22.10)	24.45 (18.23)	18.34 (13.67)
Speed—Mph (km/h)	5.14 (8.28)	4.61 (7.43)	4.07 (6.55)	3.57 (5.74)	3.06 (4.92)	2.52 (4.06)	2.03 (3.27)
Slip %	6.56	7.13	7.46	7.69	7.91	8.02	7.24

Department of Agricultural Engineering

Dates of Test: October 29 to November 14, 1981

Manufacturer: UNIVERSAL TRACTOR BRASOV (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** 2.088 gal *(7.904 l)* **Drained from motor** 1.603 gal *(6.067 l)* **Transmission lubricant** Exxon torque fluid 56 or equiv. **Final drive lubricant** SAE 90 gearlube **Total time engine was operated** 43.5 hours

ENGINE: Make UTB diesel **Type** three cylinder vertical **Serial No.** D-115.050X003637 **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 *(2697 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 standard **Serial No.** 415334 **Tread width** rear 52.2″ *(1327 mm)* to 76.3″ *(1937 mm)* front 50.4″*(1280 mm)* to 77.5″ *(1969 mm)* **Wheel base** 76″ *(1930 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 26.8″ *(680 mm)* Vertical distance above roadway 28″ *(711 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 1.5 *(2.5)* second 2.3 *(3.7)* third 3.4 *(5.4)* fourth 4.3 *(7.0)* fifth 5.5 *(8.8)* sixth 8.3 *(13.3)* seventh 12.1 *(19.5)* eighth 15.6 *(25.2)* reverse 2.2 *(3.5)*, 7.9 *(12.7)* **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 109″ *(2.77 m)* left 109″ *(2.77 m)* (on concrete surface without brake) right 124″ *(3.15 m)* left 124″ *(3.15 m)* **Turning space diameter** (on concrete surface with brake applied) right 225″ *(5.71 m)* left 225″ *(5.71 m)* (on concrete surface without brake) right 255″ *(6.48 m)* left 255″ *(6.48 m)* **Power take-off** 540 rpm at 2160 engine rpm.

REPAIRS and ADJUSTMENTS: The left rear axle oil seal was replaced after break-in period. Missing air baffles above radiator were installed during preliminary PTO test. The throttle lever friction disc was tightened after the 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 main-

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	100.0
75% of Pull at Maximum Power—Ten Hours	98.0
50% of Pull at Maximum Power—Two Hours	96.5
50% of Pull at Reduced Engine Speed—Two Hours	93.5
Bystander in 8th gear	89.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 14.9-28; 6; 20 *(140)*	Two 14.9-28; 6; 20 *(140)*
Ballast	—Liquid (each)	680 lb *(308 kg)*	None
	—Cast Iron (each)	815 lb *(370 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 7.50-16; 6; 28 *(195)*	Two 7.50-16; 6; 28 *(195)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	468 lb *(212 kg)*	None
Height of Drawbar		20.5 in *(520 mm)*	20.5 in *(520 mm)*
Static Weight with Operator—Rear		5815 lb *(2638 kg)*	2825 lb *(1281 kg)*
—Front		2395 lb *(1086 kg)*	1460 lb *(662 kg)*
—Total		8210 lb *(3724 kg)*	4285 lb *(1943 kg)*

tained at 155°F *(68.2°C)*. Five 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 **1415.**

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Engineer-in Charge

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Long 510 Diesel

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