

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1977

Test 1246: Steiger Bearcat III ST-220 Diesel

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Nebraska Tractor Test Lab, "Test 1246: Steiger Bearcat III ST-220 Diesel" (1977). *Nebraska Tractor Tests*. 1566.

<https://digitalcommons.unl.edu/tractormuseumlit/1566>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA TRACTOR TEST 1246 — STEIGER BEARCAT III ST-220 DIESEL

DRAWBAR PERFORMANCE

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 6th Gear											
170.48 (127.12)	10273 (45.70)	6.22 (10.02)	2100	3.15	12.872 (48.727)	0.527 (0.321)	13.24 (2.609)	180 (81.9)	65 (18.3)	74 (23.3)	28.890 (97.557)
75% of Pull at Maximum Power—Ten Hours 6th Gear											
139.66 (104.14)	7868 (35.00)	6.66 (10.71)	2227	2.25	11.086 (41.964)	0.554 (0.337)	12.60 (2.482)	176 (79.7)	60 (15.3)	76 (24.4)	28.891 (97.561)
50% of Pull at Maximum Power—Two Hours 6th Gear											
95.70 (71.36)	5271 (23.45)	6.81 (10.96)	2258	1.38	8.665 (32.801)	0.632 (0.385)	11.04 (2.176)	176 (79.7)	63 (16.9)	83 (28.3)	28.895 (97.574)
50% of Pull at Reduced Engine Speed—Two Hours 8th Gear											
95.32 (71.08)	5257 (23.38)	6.80 (10.94)	1364	1.42	6.785 (25.685)	0.497 (0.302)	14.05 (2.767)	178 (81.1)	61 (16.1)	83 (28.3)	28.805 (97.270)

MAXIMUM POWER IN SELECTED GEARS

154.56 (115.26)	26936 (119.82)	2.15 (3.46)	2183	14.74	2nd Gear			178 (81.1)	64 (17.8)	65 (18.3)	28.720 (96.983)
167.03 (124.55)	21772 (96.85)	2.88 (4.63)	2100	8.10	3rd Gear			178 (81.1)	65 (18.3)	80 (26.7)	28.860 (97.456)
171.41 (127.82)	17066 (75.91)	3.77 (6.06)	2099	5.44	4th Gear			179 (81.7)	65 (18.3)	79 (26.1)	28.860 (97.456)
175.58 (130.93)	13592 (60.46)	4.84 (7.80)	2100	3.97	5th Gear			181 (82.8)	65 (18.3)	78 (23.6)	28.860 (97.456)
174.14 (129.86)	10483 (46.63)	6.23 (10.02)	2100	3.07	6th Gear			181 (82.5)	65 (18.3)	77 (25.0)	28.870 (97.490)
172.60 (128.71)	7924 (35.25)	8.17 (13.14)	2100	2.23	7th Gear			180 (81.9)	65 (18.3)	81 (27.2)	28.860 (97.456)

LUGGING ABILITY IN RATED GEAR (6th)

Crankshaft Speed rpm	2100	1886	1680	1468	1256	1053
Pull—lbs (kN)	10483 (46.63)	11299 (50.26)	12154 (54.06)	12712 (56.54)	12677 (56.39)	12180 (54.18)
Increase in Pull %	0	8	16	21	21	16
Power—Hp (kW)	174.14 (129.86)	168.12 (125.37)	160.65 (119.80)	146.46 (109.21)	124.96 (93.18)	100.74 (75.12)
Speed—Mph (km/h)	6.23 (10.02)	5.58 (8.98)	4.96 (7.98)	4.32 (6.95)	3.70 (5.95)	3.10 (4.99)
Slip %	3.07	3.30	3.45	3.90	3.75	3.45

TRACTOR SOUND LEVEL WITH CAB

	dB(A)
Maximum Available Power—Two Hours	79.0
75% of Pull at Maximum Power—Ten Hours	81.5
50% of Pull at Maximum Power—Two Hours	80.5
50% of Pull at Reduced Engine Speed—Two Hours	76.5
Bystander in 10th gear	90.5

TIRES, BALLAST AND WEIGHT

Rear Tires		Without Ballast	
Ballast	—No., size, ply & psi (kPa) —Liquid (each) —Cast Iron (each)	Four 23.1-30; 8; inner 14 (100), outer 12 (80) None None	
Front Tires			
Ballast	—No., size, ply & psi (kPa) —Liquid (each) —Cast Iron (each)	Four 23.1-30; 8; inner 14 (100), outer 12 (80) None None	
Height of drawbar		16 in (410 mm)	
Static weight with operator—rear		12020 lb (5452 kg)	
front		17360 lb (7874 kg)	
total		29380 lb (13326 kg)	

Department of Agricultural Engineering

Dates of Test: May 24 to June 2, 1977

Manufacturer: Steiger Tractor Inc., 3101 First Ave. North, Fargo, North Dakota 58102

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 51.8 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8386 **Fuel weight** 6.982 lbs/gal (0.839 kg/l) **Oil SAE 30 API service classification SB/SE-CA/CD** **To motor** 10.462 gal (39.603 l) **Drained from motor** 9.182 gal (34.758 l) **Transmission and final drive lubricant** IH Hi-tran or equivalent **Total time engine was operated** 46.5 hours

ENGINE: Make Cummins Diesel **Type** 6 cylinder vertical **Serial No.** 10566957 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 5.5" × 6.0" (139.7 mm × 152.4 mm) **Compression ratio** 15.8 to 1 **Displacement** 855 cu in (14016 ml) **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** primary and safety elements with centrifugal precleaner and aspirator **Oil filter** one screw-on cartridge and one by-pass element **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission oil **Fuel filter** two full flow spin-on cartridges **Muffler** vertical **Cooling medium temperature control** thermostat

CHASSIS: **Type** 4 wheel drive with duals **Serial No.** 103-00211 **Tread width** rear 76.1" (1933 mm) to 135.9" (3452 mm) front 76.1" (1933 mm) to 135.9" (3452 mm) **Wheel base** 128" (3251 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 75.9" (1928 mm) Vertical distance above roadway 47.4" (1204 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 (3.0) second 2.3 (3.8) third 3.0 (4.9) fourth 3.8 (6.2) fifth 4.8 (7.8) sixth 6.2 (10.0) seventh 8.0 (12.9) eighth 10.3 (16.5) ninth 12.9 (20.7) tenth 16.3 (26.3) reverse 1.8 (3.0) and 2.3 (3.8) **Clutch** two cerametallic dry plates hydraulically operated by foot pedal **Brakes** dual caliper disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 291.5" (7.40 m) left 291" (7.39 m) **Turning space diameter** (on concrete surface without brake) right 606" (15.39 m) left 605" (15.37 m).

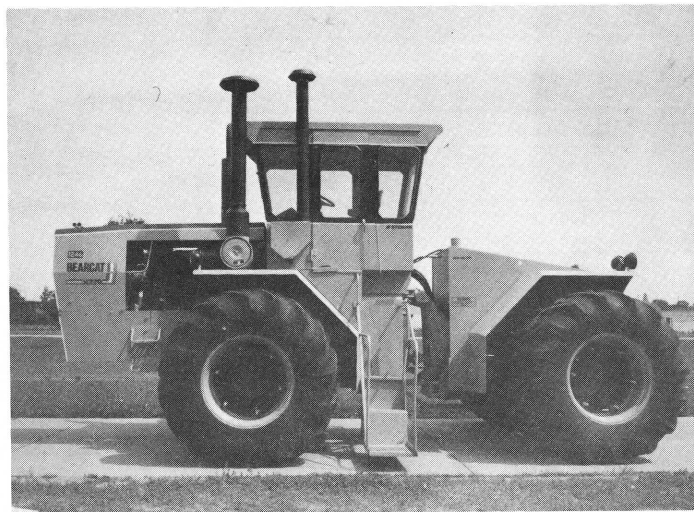
REPAIRS and ADJUSTMENTS: At the conclusion of the 2 hour Maximum Available Power test a fuel fitting on the engine was found to be leaking. This was repaired and the test rerun.

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 125°F (51.4°C). Six gears were chosen between 15% slip and 15 mph (24.1 km/h). The tractor did not meet manufacturer's claim of 180 estimated Drawbar Horsepower.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1246**.

LOUIS I. LEVITICUS
Engineer-in Charge

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



Steiger Bearcat III ST-220 Diesel