

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

January 1978

Test 1273: Steiger Cougar III PT-270 With or Without PTO (20-Speed)

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 1273: Steiger Cougar III PT-270 With or Without PTO (20-Speed)" (1978). *Nebraska Tractor Tests*. 1592.

<https://digitalcommons.unl.edu/tractormuseumlit/1592>

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 1273 — STEIGER COUGAR III PT 270 DIESEL
and STEIGER COUGAR III PT 270 DIESEL WITHOUT PTO
20 SPEED

POWER TAKE-OFF PERFORMANCE (SEE NOTE)

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 (PT 270)									
Rated PTO HP—One Hour—Full Throttle Setting (PTO Speed—998 rpm)									
105.68 (78.80)	2412	11.055 (41.847)	0.724 (0.440)	9.56 (1.883)	184 (84.3)	56 (13.3)	75 (24.0)	28.580 (96.510)	
Rated PTO HP—One Hour—Minimum Throttle Setting (PTO Speed—1014 rpm)									
105.66 (78.79)	1703	8.538 (32.318)	0.559 (0.340)	12.38 (2.438)	184 (84.4)	56 (13.3)	75 (24.0)	28.580 (96.510)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours— Minimum Throttle Setting									
91.27 (68.06)	1766	7.652 (28.965)	0.580 (0.353)	11.93 (2.350)	181 (82.8)	57 (13.9)	75 (23.9)	..... .....
0.00 (0.00)	1946	3.186 (12.062)	..... .....	..... .....	178 (81.4)	57 (13.9)	74 (23.6)	..... .....
47.08 (35.10)	1880	5.276 (19.972)	0.776 (0.472)	8.92 (1.758)	180 (82.5)	58 (14.2)	76 (24.4)	..... .....
105.47 (78.65)	1694	8.519 (32.247)	0.559 (0.340)	12.38 (2.439)	183 (83.9)	56 (13.6)	74 (23.3)	..... .....
23.71 (17.68)	1918	4.205 (15.918)	1.227 (0.746)	5.64 (1.111)	179 (81.7)	57 (13.9)	75 (23.9)	..... .....
70.02 (52.21)	1834	6.329 (23.960)	0.626 (0.381)	11.06 (2.179)	181 (82.8)	58 (14.2)	76 (24.4)	..... .....
Av Av	56.26 (41.95)	5.861 (22.187)	0.721 (0.439)	9.60 (1.891)	180 (82.5)	57 (13.9)	75 (23.9)	28.960 (97.794)	

DRAWBAR PERFORMANCE (PT 270)

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 11th (3HL) Gear												
211.17 (157.47)	12573 (55.93)	6.30 (10.14)	2201	2.78	16.582 (62.771)	0.543 (0.331)	12.73 (2.509)	185 (85.0)	44 (6.7)	52 (11.1)	29.000 (97.929)	
75% of Pull at Maximum Power—Ten Hours 11th (3HL) Gear												
171.83 (128.14)	9524 (42.37)	6.77 (10.89)	2348	2.09	14.548 (55.072)	0.586 (0.356)	11.81 (2.327)	184 (84.6)	56 (13.1)	58 (14.3)	28.651 (96.750)	
50% of Pull at Maximum Power—Two Hours 11th (3HL) Gear												
119.97 (89.46)	6434 (28.62)	6.99 (11.25)	2410	1.40	11.723 (44.377)	0.676 (0.411)	10.23 (2.016)	184 (84.4)	46 (7.5)	56 (13.1)	28.980 (97.861)	
50% of Pull at Reduced Engine Speed—Two Hours 15th (4HL) Gear												
120.52 (89.88)	6468 (28.77)	6.99 (11.25)	1456	1.40	9.068 (34.326)	0.521 (0.317)	13.29 (2.618)	183 (83.9)	46 (7.5)	57 (13.6)	28.970 (97.827)	

MAXIMUM POWER IN SELECTED GEAR

189.47 (141.29)	30122 (133.99)	2.36 (3.80)	2213	14.92	4th (1HH) Gear			187 (85.8)	45 (7.2)	60 (15.6)	29.000 (97.929)		
206.33 (153.86)	26574 (118.21)	2.91 (4.69)	2202	7.89	5th (2LL) Gear			185 (85.0)	45 (7.2)	60 (15.6)	29.010 (97.962)		
210.68 (157.11)	23701 (105.43)	3.33 (5.36)	2199	6.23	6th (2LH) Gear			185 (84.7)	46 (7.8)	60 (15.6)	29.020 (97.996)		
211.61 (157.80)	20770 (92.39)	3.82 (6.15)	2199	4.67	7th (2HL) Gear			191 (88.3)	60 (15.6)	70 (21.1)	28.690 (96.882)		
213.69 (159.35)	18480 (82.20)	4.34 (6.98)	2199	3.96	8th (2HH) Gear			191 (88.3)	60 (15.6)	70 (21.1)	28.690 (96.882)		
216.30 (161.30)	16522 (73.50)	4.91 (7.90)	2199	3.48	9th (3LL) Gear			193 (89.2)	60 (15.6)	70 (21.1)	28.690 (96.882)		
216.95 (161.78)	14638 (65.11)	5.56 (8.94)	2199	2.99	10th (3LH) Gear			192 (88.6)	60 (15.6)	70 (21.1)	28.690 (96.882)		
219.39 (163.60)	13081 (58.19)	6.29 (10.12)	2202	2.99	11th (3HL) Gear			186 (85.3)	47 (8.3)	62 (16.7)	29.980 (97.861)		
217.06 (161.86)	11422 (50.81)	7.13 (11.47)	2201	2.32	12th (3HH) Gear			192 (88.6)	60 (15.6)	70 (21.1)	28.690 (96.882)		
215.07 (160.38)	9764 (43.43)	8.26 (13.29)	2202	1.91	13th (4LL) Gear			190 (87.5)	60 (15.6)	70 (21.1)	28.690 (96.882)		

LUGGING ABILITY IN 11th (3HL) GEAR

Crankshaft Speed rpm		2202	1979	1757	1538	1319	1100
Pull—lbs (kN)		13081 (58.19)	14271 (63.48)	15208 (67.65)	15657 (69.64)	15451 (68.73)	12447 (55.37)
Increase in Pull %		0	9	16	20	18	-5
Power—Hp (kW)		219.39 (163.60)	214.95 (160.29)	202.87 (151.28)	182.59 (136.16)	154.54 (115.24)	104.50 (77.93)
Speed—Mph (km/h)		6.29 (10.12)	5.65 (9.09)	5.00 (8.05)	4.37 (7.04)	3.75 (6.04)	3.15 (5.07)
Slip %		2.99	2.99	3.31	3.48	3.31	2.66

Department of Agricultural Engineering

Dates of Test: April 20 to May 9, 1978

Manufacturer: STEIGER TRACTOR INC.,
3101 First Avenue North, Fargo, North Dakota
58102

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 50.4 (rating taken from oil company's
typical inspection data) Specific gravity converted
to 60°/60° (15°/15°) 0.8311 Fuel weight 6.920 lbs/
gal (0.829 kg/l) Oil SAE 30 API service classifi-
cation SB/SE-CA/CD To motor 7.411 gal
(28.054 l) Drained from motor 6.350 gal
(24.037 l) Transmission and drop box lubricant
303 or equivalent Final drive lubricant SAE
80W90 Total time engine was operated 49.5
hours

ENGINE: Make Caterpillar Diesel Type six
cylinder vertical with turbocharger and inter-
cooler Serial No. 66D 23188 Crankshaft
lengthwise Rated rpm 2200 Bore and stroke
4.75" × 6.00" (120.7 mm × 152.4 mm) Compres-
sion ratio 17.5 to 1 Displacement 638 cu in
(10454 ml) Cranking system 12 volt Lubrication
pressure Air cleaner primary and secondary
paper elements with aspirator Oil filter full flow
screw-on cartridge Oil cooler engine coolant heat
exchanger for crankcase oil, radiator for transmis-
sion and drop box oil, radiator for hydrostatic
PTO oil Fuel filter one paper cartridge Muffler
none Cooling medium temperature control
thermostat

CHASSIS: Type four wheel drive with duals
Serial No. 143-00042 Tread width rear 79.0"
(2005 mm) and 136.4" (3465 mm) front 79.0" (2005
mm) and 136.4" (3465 mm) Wheel base 132.5"
(3365 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
73.3" (1860 mm) Vertical distance above roadway
45.8" (1165 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 Advert-
ised speeds mph (km/h) first 1.8 (3.0) second 2.1
(3.4) third 2.3 (3.8) fourth 2.6 (4.3) fifth 3.0 (4.9)
sixth 3.4 (5.5) seventh 3.8 (6.2) eighth 4.3 (7.0)
ninth 4.9 (7.8) tenth 5.5 (8.8) eleventh 6.2 (10.0)
twelfth 7.0 (11.2) thirteenth 8.0 (12.9) fourteenth
9.1 (14.6) fifteenth 10.3 (16.5) sixteenth 11.6
(18.6) seventeenth 12.9 (20.7) eighteenth 14.5
(23.3) nineteenth 16.3 (26.3) twentieth 18.4 (29.6)
reverse 1.8 (3.0), 2.1 (3.4), 2.3 (3.8), 2.6 (4.3)
Clutch two dry plates hydraulically operated by
foot pedal Brakes multiple dry disc hydraulically
operated by foot pedal Steering hydrostatic and
articulated Turning radius (on concrete surface
without brake) right 254.5" (6.46 m) left 253.5"
(6.44 m) Turning space diameter (on concrete
surface without brake) right 532" (13.51 m) left
530" (13.46 m) Power take-off hydrostatic
drive—nominally 1000 rpm within the engine
speed range of 1700 rpm to high idle.

DRAWBAR PERFORMANCE (PT 270 Without PTO)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			
					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	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 11th (3HL) Gear											
214.34 (159.83)	12774 (56.82)	6.29 (10.13)	2200	2.86	16.528 (62.566)	0.534 (0.325)	12.97 (2.555)	190 (87.8)	59 (14.7)	69 (20.3)	28.735 (97.034)
75% of Pull at Maximum Power—Two Hours 11th (3HL) Gear											
180.81 (134.83)	9990 (44.44)	6.79 (10.92)	2357	2.08	14.523 (54.976)	0.556 (0.338)	12.45 (2.452)	184 (84.4)	51 (10.4)	57 (14.0)	28.915 (97.642)
50% of Pull at Maximum Power—Two Hours 11th (3HL) Gear											
123.95 (92.43)	6613 (29.42)	7.03 (11.31)	2423	1.36	11.525 (43.625)	0.643 (0.391)	10.76 (2.119)	183 (83.9)	38 (3.3)	43 (6.1)	29.100 (98.266)
50% of Pull at Reduced Engine Speed—Two Hours 15th (4HL) Gear											
124.79 (93.05)	6654 (29.60)	7.03 (11.32)	1466	1.36	8.996 (34.052)	0.499 (0.303)	13.87 (2.733)	184 (84.2)	43 (6.1)	55 (12.5)	29.070 (98.165)

MAXIMUM POWER IN SELECTED GEARS

194.24 (144.85)	29950 (133.23)	2.43 (3.91)	2284	14.98	4th (1HH) Gear			185 (85.0)	46 (7.8)	60 (15.6)	29.040 (98.064)
211.60 (157.79)	27567 (122.62)	2.88 (4.63)	2200	8.77	5th (2LL) Gear			186 (85.3)	46 (7.8)	60 (15.6)	29.030 (98.030)
218.14 (162.67)	24681 (109.78)	3.31 (5.33)	2199	6.69	6th (2LH) Gear			186 (85.3)	46 (7.8)	60 (15.6)	29.020 (97.996)
218.22 (162.73)	21471 (95.51)	3.81 (6.13)	2200	5.07	7th (2HL) Gear			186 (85.6)	60 (15.6)	69 (20.6)	28.700 (96.916)
219.17 (163.44)	19002 (84.53)	4.33 (6.96)	2198	4.36	8th (2HH) Gear			188 (86.7)	60 (15.6)	69 (20.6)	28.700 (96.916)
224.54 (167.44)	17229 (76.64)	4.89 (7.87)	2199	3.96	9th (3LL) Gear			185 (85.0)	48 (8.9)	63 (17.2)	28.960 (97.794)
222.77 (166.12)	15066 (67.02)	5.54 (8.92)	2198	3.15	10th (3LH) Gear			192 (88.6)	60 (15.6)	69 (20.6)	28.710 (96.949)
222.17 (165.68)	13258 (58.97)	6.28 (10.11)	2198	2.91	11th (3HL) Gear			191 (88.3)	59 (15.0)	69 (20.6)	28.720 (96.983)
220.81 (164.66)	11625 (51.71)	7.12 (11.46)	2201	2.41	12th (3HH) Gear			189 (87.2)	60 (15.6)	69 (20.6)	28.690 (96.882)
219.56 (163.73)	9981 (44.40)	8.25 (13.28)	2201	1.99	13th (4LL) Gear			187 (86.1)	60 (15.6)	69 (20.6)	28.690 (96.882)

LUGGING ABILITY IN 11th (3HL) GEAR

Crankshaft Speed rpm	2198	1978	1764	1541	1322	1096
Pull—lbs (kN)	13258 (58.97)	14658 (65.20)	15601 (69.40)	16031 (71.31)	15798 (70.27)	12643 (56.24)
Increase in Pull %	0	11	18	21	19	-5
Power—Hp (kW)	222.17 (165.68)	220.56 (164.47)	208.65 (155.59)	186.92 (139.38)	158.31 (118.06)	105.78 (78.88)
Speed—Mph (km/h)	6.28 (10.11)	5.64 (9.08)	5.02 (8.07)	4.37 (7.04)	3.76 (6.05)	3.14 (5.05)
Slip %	2.91	3.15	3.48	3.64	3.48	2.82

	With PTO	W/O PTO
TRACTOR SOUND LEVEL WITH CAB	dB(A)	dB(A)

Maximum Available Power—Two Hours	78.5	78.0
75% of Pull at Maximum Power—Ten Hours	78.0	78.0
50% of Pull at Maximum Power—Two Hours	77.5	78.5
50% of Pull at Reduced Engine Speed—Two Hours	75.5	75.0
Bystander in 19th (5HL) gear	100.5	100.5

TIRES, BALLAST AND WEIGHT

Rear Tires		With Ballast	Without Ballast
—No., size, ply & psi (kPa)		Four 23.1-34, 8, inner 14 (95), outer 12 (80)	Four 23.1-34, 8, inner 14 (95), outer 12 (80)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	None	None
Front Tires		With Ballast	Without Ballast
—No., size, ply & psi (kPa)		Four 23.1-34, 8, inner 14 (95), outer 12 (80)	Four 23.1-34, 8, inner 14 (95), outer 12 (80)
Ballast	—Liquid (each inner)	748 lb (339 kg)	None
	—Cast Iron (each)	None	None
Height of Drawbar		14.5 in (370 mm)	14.5 in (370 mm)
Static Weight with Operator—Rear		13780 lb (6250 kg)	13780 lb (6251 kg)
—Front		18430 lb (8360 kg)	16935 lb (7681 kg)
—Total		32210 lb (14610 kg)	30715 lb (13932 kg)

NOTE: The Power take-off on this tractor does not transmit full engine power. The speed and the power are controlled by an electro-hydraulic system. The PTO test was run at two speeds: Full throttle setting and the minimum setting which would maintain standard PTO speed and advertised power. The following maximum variations were observed during the PTO runs:

	Eng. RPM	PTO RPM
Full Throttle	2409-2415	992-1004
Minimum Throttle	1679-1737	1011-1017
85% Torque	1731-1793	1023-1035
¾ × 85% Torque	1804-1850	1044-1062
½ × 85% Torque	1859-1891	1053-1081
¼ × 85% Torque	1895-1927	1060-1090

REPAIRS AND ADJUSTMENTS: During preliminary PTO runs the automatic control system for the hydrostatic PTO drive required adjustment.

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 131°F (55.0°C). Ten 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 **1273**.

LOUIS I. LEVITICUS
Engineer-in Charge

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

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director



Steiger Cougar III PT-270 Diesel