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Nebraska Tractor Tests

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Larsen

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January 1957

## Test 613: Case 311 Gasoline

Nebraska Tractor Test Laboratory Submitted by Larsen Museum  
*University of Nebraska*

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NEBRASKA TRACTOR TEST NO. 613 CASE 311 GASOLINE

Department of Agricultural Engineering, University of Nebraska  
 Dates of test: April 15 to April 23, 1957  
 Manufacturer: J. I. CASE COMPANY, RACINE, WISCONSIN  
 Manufacturer's rating: Not Rated

BELT HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Fuel Consumption			Temp. Deg. F.			Barometer Inches of Mercury
		Gal per hr	Hp hr per gal	Lb per hp hr	Cooling medium	Air wet bulb	Air dry bulb	
TEST B - 100% MAXIMUM LOAD - TWO HOURS								
33.00	1750	3.012	10.96	0.556	169	58	69	28.947
TEST C - OPERATING MAXIMUM LOAD - ONE HOUR								
32.32	1750	2.749	11.76	0.518	169	58	69	28.950
TEST D - RATED LOAD - ONE HOUR								
29.33	1750	2.573	11.40	0.535	161	57	67	28.950
TEST E - VARYING LOAD - TWO HOURS (20 minute runs; last line average)								
29.32	1750	2.575	11.39	0.535	160	56	65	-- ---
1.43	1891	1.117	1.28	4.762	111	56	64	-- ---
15.63	1860	1.861	8.40	0.726	138	56	64	-- ---
31.26	1662	2.639	11.85	0.514	155	56	64	-- ---
7.90	1875	1.442	5.48	1.113	132	56	65	-- ---
22.98	1826	2.250	10.21	0.597	146	58	65	-- ---
18.09	1810	1.981	9.13	0.667	140	56	64	28.950

TEST L - OPERATING MAXIMUM TORQUE

% of rated rpm (engine)	100	95	90	85	80	76	70	65	60	55
% of rated-speed torque	100	102	105	107	110	112	113	113	113	112

DRAWBAR HORSEPOWER TESTS

Hp	Draw bar pull lbs	Speed miles per hr	Crank shaft speed rpm	Slip of drive wheels %	Fuel Consumption			Temp. Deg. F.			Barometer inches of Mercury
					Gal per hr	Hp hr per gal	Lb per hp hr	Cooling med.	Air wet bulb	Air dry bulb	
TEST H - RATED LOAD - TEN HOURS - 3rd Gear											
23.40	1733	5.06	1748	3.46	2.323	10.07	0.605	160	64	74	28.606
TEST F - 100% MAXIMUM LOAD											
29.29	2183	5.03	1756	4.39	3rd Gear			168	65	75	28.745
TEST G - OPERATING MAXIMUM LOAD											
25.98	4186	2.33	1744	14.00	1st Gear (Part throttle)			150	52	60	28.970
28.74	2878	3.74	1751	6.13	2nd Gear			166	64	74	28.720
28.87	2159	5.01	1750	4.45	3rd Gear			169	64	74	28.720
24.94	734	12.74	1749	1.57	4th Gear			154	52	61	28.970
TEST J - OPERATING MAXIMUM LOAD											
27.81	2123	4.91	1748	7.50	3rd Gear			147	57	60	28.910
TEST K - OPERATING MAXIMUM LOAD											
25.80	2289	4.23	1753	13.13	3rd Gear (Part throttle)			143	55	57	28.901

Tractor Test No. 613

TIRES, WHEELS AND WEIGHT

	Tests F, G, & H	Test J	Test K
<u>Rear wheels</u>			
Type	Pressed steel	Pressed steel	Pressed steel
Liquid ballast	307 lb each	None	None
Added cast iron	679 lb each	None	None
<u>Rear tires</u>			
No. and size	Two 12-28	Two 12-28	Two 10-28
Ply	4	4	4
Air Pressure	14 lb	14 lb	12 lb
<u>Front wheels</u>			
Type	Pressed steel	Pressed steel	Pressed steel
Liquid ballast	43 lb each	None	None
Added cast iron	188 lb each	None	None
<u>Front tires</u>			
No. and size	Two 5.50-16	Two 5.50-16	Two 5.50-16
Ply	4	4	4
Air pressure	20 lb	20 lb	20 lb
<u>Height of drawbar</u>	14 1/2 inches	15 inches	12 inches
<u>Static weight</u>			
Rear end	4226 lb	2254 lb	2180 lb
Front end	1594 lb	1132 lb	1130 lb
<u>Total weight as tested with operator</u>	5995 lb	3561 lb	3485 lb

FUEL, OIL, WATER and TIME Fuel Gasoline Octane No. ASTM 82 Research 88  
(rating taken from oil company's typical inspection data) Weight per gallon 6.094 lb  
Oil SAE 20-20W To motor 1.007 gal Drained from motor 0.960 gal Water used 0.064 gal  
Total time motor was operated 42 1/2 hours.

CHASSIS TYPE Tricycle Serial No. 6075363 Tread width rear 48" to 88" front  
6 1/4" and 11 1/2" Wheel base 84 3/8" Hydraulic control system direct engine drive  
with throw out lever Advertised speeds mph first 2.68 second 3.94 third 5.18  
fourth 12.80 reverse 3.19 Belt pulley diam. 10 1/4" face 6" rpm 1190 Belt speed  
3193 fpm Belt flat Length 57' Width 5" Thickness 0.210" Maximum slip 0.81%  
Clutch single plate dry disc operated by foot pedal Seat pressed steel cushioned  
by rubber in torsion Brakes double disc brakes operated by two foot pedals Equalized  
by locking pedals together Power take-off conventional type Steering power steering  
not available.

ENGINE Make Case Type 4 cylinder vertical Serial No. 100N00114 Crankshaft  
mounted lengthwise Head I Lubrication pressure Bore and stroke 3 3/8" x 4 1/8"  
Rated rpm 1750 Compression ratio 7.1 to 1 Displacement 148 cu. in. Port diameter  
valves Inlet 1 3/16" Exhaust 1 3/32" Governor variable speed centrifugal Carburetor  
size 7/8" Ignition system battery Starting system 6 volt battery Air cleaner oil  
washed wire mesh Muffler was used Oil filter none Cooling medium temperature  
control thermostat.

REPAIRS AND ADJUSTMENTS No repairs or adjustments


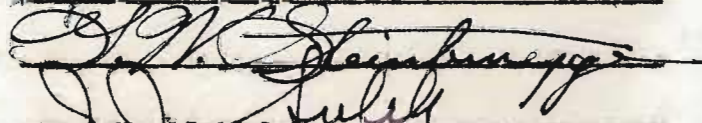
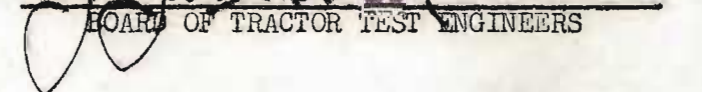
REMARKS All test results were determined from observed data and without  
allowances, additions or deductions. Tests B and F were made with carburetor set  
for 100% maximum belt horsepower and data from these tests were used in determining  
the horsepower to be developed in tests D and H, respectively. Tests C, D, E, G,  
H, J, K and L were made with an operating setting of the carburetor (selected by  
the manufacturer) of 97.9% of maximum belt horsepower.

#### HORSEPOWER SUMMARY

	DRAWBAR	BELT
1. Sea level (calculated) maximum horsepower (based on 60°F and 29.92" Hg)	30.92	34.40
2. Observed maximum horsepower (tests F and B)	29.29	33.00
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (ASAE and SAE ratings)	23.19	29.24

We, the undersigned, certify that this is a true and correct report of official  
Tractor Test No. 613,

  
\_\_\_\_\_  
Engineer-in-Charge

  
\_\_\_\_\_  
(Chairman)  
  
\_\_\_\_\_  
  
\_\_\_\_\_  
BOARD OF TRACTOR TEST ENGINEERS