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Nebraska Tractor Tests

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1-1-1958

## Test 639: Ford Model 841L (LPG)

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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Department of Agricultural Engineering  
Dates of test: March 12 to 31, 1958  
Manufacturer: FORD MOTOR COMPANY, BIRMINGHAM, MICHIGAN  
Manufacturer's rating: Not rated

NEBRASKA TRACTOR TEST NO. 639

FORD 841 L (LPG)

**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 POWER —TWO HOURS								
41.97	2000	4.976	8.43	0.504	171	51	69	29.110
TEST C—OPERATING MAXIMUM POWER—ONE HOUR								
41.03	2001	4.584	8.95	0.475	170	51	69	29.105
TEST D—RATED POWER—ONE HOUR								
37.06	2150	4.464	8.30	0.512	167	52	71	29.110
TEST E—VARYING POWER—TWO HOURS (20 minute runs; last line average)								
37.01	2147	4.419	8.38	0.507	168	52	72	.....
1.88	2295	2.019	0.93	4.564	132	51	69	.....
19.38	2241	3.176	6.10	0.697	144	51	70	.....
40.87	1994	4.525	9.03	0.471	173	52	72	.....
9.87	2276	2.668	3.70	1.149	137	51	70	.....
23.22	2180	3.776	7.47	0.569	156	52	72	.....
22.87	2189	3.431	6.67	0.638	152	52	71	29.105

**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 POWER—TEN HOURS—5th Gear											
30.93	2559	4.53	2179	5.23	4.308	7.18	0.592	133	31	33	29.037
TEST F—100% MAXIMUM POWER											
40.32	3726	4.06	2006	7.81	5th Gear	.....	.....	139	31	35	29.080
TEST G—OPERATING MAXIMUM POWER											
26.55	4621	2.15	2002	9.89	1st Gear (part throttle)	.....	.....	137	44	49	28.870
32.24	4638	2.61	2000	10.10	2nd Gear (part throttle)	.....	.....	140	44	49	28.870
38.72	4448	3.26	2003	9.84	3rd Gear	.....	.....	135	31	35	29.080
38.25	3684	3.89	2002	7.92	4th Gear	.....	.....	138	31	35	29.080
39.11	3614	4.06	2004	7.81	5th Gear	.....	.....	138	31	35	29.080
38.12	2814	5.08	2001	6.02	6th Gear	.....	.....	133	32	35	29.060
38.58	2383	6.07	2002	5.18	7th Gear	.....	.....	132	32	35	29.060
37.89	2282	6.23	1998	4.90	8th Gear	.....	.....	133	32	35	29.060
36.46	1610	8.49	2006	3.98	9th Gear	.....	.....	132	30	34	29.070
35.68	1447	9.25	2003	3.46	10th Gear	.....	.....	134	30	34	29.070
34.74	995	13.09	2009	2.22	11th Gear	.....	.....	137	30	34	29.070
22.40	570	14.74	1499	1.19	12th Gear	.....	.....	137	44	50	28.870
TEST J—OPERATING MAXIMUM POWER											
28.08	2702	3.90	2001	13.97	5th Gear (part throttle)	.....	.....	142	59	62	28.725
TEST K—SPEED-PULL CHARACTERISTIC											
Pounds Pull			2559	3614	3650	3650	3700	3800	3600		
Horsepower			30.93	39.11	35.0	32.1	27.6	25.3	19.2		
Miles Per Hour			4.53	4.06	3.6	3.3	2.8	2.5	2.0		

**TIRES, WHEELS AND WEIGHT**

	Tests F, G, H & K	Test J
<b>Rear wheels</b>		
Type	Pressed Steel	Pressed Steel
Liquid ballast	367 lb each	None
Added cast iron	1068 lb each	None
<b>Rear tires</b>		
No. and size	Two 12-28	Two 12-28
Ply	4	4
Air pressure	14 lb	14 lb
<b>Front wheels</b>		
Type	Pressed Steel	Pressed Steel
Liquid ballast	64 lb each	None
Added cast iron	250 lb each	None
<b>Front tires</b>		
No. and size	Two 6.00-16	Two 6.00-16
Ply	4	4
Air pressure	32 lb	28 lb
<b>Height of drawbar</b>	22 inches	23½ inches
<b>Static weight</b>		
Rear end	4856 lb	1986 lb
Front end	1954 lb	1326 lb
<b>Total weight as tested with operator</b>	6985 lb	3487 lb

**HORSEPOWER SUMMARY**

	Drawbar	Belt
1. Sea level (calculated) maximum horsepower (based on 60°F and 29.92" Hg)	40.48	43.51
2. Observed maximum horsepower (tests F and B)	40.32	41.97
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (ASAE and SAE ratings)	30.36	36.98

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 639.

L. F. LARSEN  
Engineer-in-Charge

L. W. HURLBUT, Chairman  
G. W. STEINBRUEGGE  
J. J. SULEK  
Board of Tractor  
Test Engineers

## EXPLANATION OF TEST REPORT

**TEST A:** The manufacturer's representative operates the tractor for a minimum of 12 hours using light to heavy drawbar loads in each gear.

This serves as a period for limber up, general observation and adjustments. Adjustments that are permissible include valve tappet clearance, breaker point gap, spark plug gaps, clutch and others of a similar nature. No new parts or accessories can be installed without having mention made of it in the report.

No data are recorded during this preliminary run except the time that the engine is operated.

### BELT HORSEPOWER TESTS

**TEST B:** The manual throttle control lever is set so that the throttle valve is held wide open and the belt load on the dynamometer is adjusted so that the engine is at the rated speed recommended by the manufacturer. Carburetor, ignition timing and manifold adjustments are all set for maximum engine power.

This test is designed to determine maximum belt horsepower of the tractor at rated speed and to measure fuel consumption at the maximum power on the belt.

**TEST C:** For tractors with carburetors the best fuel economy does not always occur when the engine develops maximum power at rated speed. Test C is intended to allow the manufacturer's representative to select a more economical fuel setting even though there is a slight loss of power. *This more practical carburetor setting is used in all later tests except test F.* The throttle valve is wide open and load adjusted to give rated rpm. Tests B and C are the same for diesel tractors which have an altogether different fuel system.

**TEST D:** The manual throttle control lever is set the same as for tests B and C allowing the governor to control engine speed at part throttle. Load is applied until 85% of maximum corrected horsepower found in test B is obtained.

This rating is somewhat less than the maximum belt horsepower in order that the operator may have a certain amount of reserve.

**TEST E:** Varying load serves to show the range of engine speeds when the engine is controlled by the governor during the following varied loads, of 20 minutes each; rated load, no load,  $\frac{1}{2}$  rated load, maximum load at wide open throttle valve,  $\frac{1}{4}$  and  $\frac{3}{4}$  rated load.

The average result of this test shows the average power and fuel consumption. Since the average tractor is subjected to varying loads, these data serve well in predicting fuel consumption and efficiency of a tractor in general use.

### DRAWBAR HORSEPOWER TESTS

In all drawbar tests the pull exerted by the tractor is transmitted by a hydraulic pressure cylinder to a recording instrument in the test car. When rubber tires are used, all tests are made on the concrete test course. The same tires, wheels and weights are used for all tests except J. All crawler type tractors are tested on an earthen test course which is maintained by grading, sprinkling and rolling so that it remains very nearly the same for each test.

**TEST F:** A drawbar test, the results of which are used to determine the rated drawbar horsepower in test H. The carburetor is set to develop maximum power as in test B. The rated gear recommended by manufacturer as plow gear is used in the test. The drawbar load is adjusted to give rated engine speed.

**TEST G:** Maximum drawbar horsepower is determined in each gear when the carburetor is set for fuel economy as in test C. The manual throttle control lever is set so that the throttle valve is held wide open and the load is applied so that the engine runs at rated engine speed.

When operating in low gear it is not uncommon for the tractor to develop less drawbar horsepower than in rated gear because of excessive wheel slippage. When excessive wheel slippage occurs the load is reduced until slippage approaches 15%. When the load is reduced it is necessary to operate the tractor engine at part throttle and control engine speed by governor action.

**TEST H:** Intended to test the ability of the tractor to run continuously for 10 hours at rated drawbar horsepower and to determine the fuel consumption during that time. Rated drawbar horsepower is 75% of 100% maximum drawbar horsepower (Test F), corrected to standard conditions.

When operating at rated horsepower the manual throttle control lever is set the same as in tests F and G allowing the governor to maintain engine speed at part throttle. This rating is less than maximum drawbar horsepower in order that the operator may have a certain amount of reserve.

**TEST J:** The tractor is operated in rated gear with all added weight removed. This test shows the effect of the removal of added weight on the performance of the tractor when compared with test G.

Removal of wheel weights generally increases wheel slippage and decreases drawbar horsepower.

**TEST K:** This is intended to show the pull, horsepower, and travel speed of the tractor at rated horsepower (taken from test H); maximum horsepower (taken from test G); and at least four other conditions obtained by reducing travel speed in 10% increments by overload.

