

November 1957

Test 626: Ford 850-L

Tractor Test & Power Museum
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Department of Agricultural Engineering
Dates of test: June 24, 1957 to July 12, 1957
Manufacturer: FORD MOTOR COMPANY,
BIRMINGHAM, MICHIGAN
Manufacturer's rating: Not rated

FORD 850-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 LOAD—TWO HOURS										
39.55	2200	5.008	7.90	0.538	179	65	71	28.662		
TEST C—OPERATING MAXIMUM LOAD—ONE HOUR										
38.22	2200	4.624	8.27	0.514	184	73	81	28.833		
TEST D—RATED LOAD—ONE HOUR										
35.50	2199	4.407	8.06	0.528	179	73	80	28.845		
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)										
35.49	2199	4.412	8.04	0.528	177	72	79	.....	
1.52	2364	1.962	0.77	5.487	141	72	78	.....	
18.72	2308	3.155	5.93	0.716	144	72	79	.....	
37.15	2053	4.496	8.26	0.514	174	72	78	.....	
9.54	2351	2.548	3.74	1.135	143	72	78	.....	
27.43	2265	3.861	7.10	0.598	165	73	79	.....	
21.64	2256	3.406	6.35	0.669	157	72	78	28.830		
TEST L—OPERATING MAXIMUM TORQUE										
% of rated rpm (engine)	100	95	90	85	80	75	70	65	60	56
% of rated-speed torque	100	103	105	108	110	112	112	111	109	109

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											
28.26	2329	4.55	1997	4.67	3.720	7.60	0.559	187	77	91	28.888
TEST F—100% MAXIMUM LOAD											
35.16	2947	4.47	2001	6.44	3rd gear	.....	.....	189	75	84	28.790
TEST G—OPERATING MAXIMUM LOAD											
26.99	5170	1.96	1997	13.34	1st gear (prt-thrtl)	.....	.....	173	75	84	28.790
34.09	3880	3.29	2000	8.48	2nd gear	.....	.....	186	73	83	28.810
34.32	2871	4.48	2000	6.22	3rd gear	.....	.....	185	73	83	28.810
34.21	2032	6.31	2000	4.48	4th gear	.....	.....	185	73	83	28.810
32.23	1053	11.48	2002	2.34	5th gear	.....	.....	172	74	86	29.035
TEST J—OPERATING MAXIMUM LOAD											
27.73	2507	4.15	1999	14.39	3rd gear (prt-thrtl)	.....	.....	186	75	89	29.015
TEST K—OPERATING MAXIMUM LOAD											
21.90	2128	3.86	2000	12.91	3rd gear (prt-thrtl)	.....	.....	171	73	89	28.720

FUEL, OIL, WATER and TIME Fuel Commercial Propane Weight per gallon 4.25 lb Oil SAE 20-20W To motor 1.174 gal Drained from motor 0.877 gal Water used 0.285 gal Total time motor was operated 46½ hours.

CHASSIS TYPE Standard Serial No. 850-L127727 Tread width rear 52" to 76" front 52" to 80" Wheel base 74.5" Hydraulic control system direct engine drive Advertised speeds mph first 2.30 second 3.66 third 4.87 fourth 6.72 fifth 11.96 reverse 3.93 Belt pulley diam. 9" Face 6½" rpm 1279 Belt speed 3015 fpm Belt flat Length 71' Width 6" Thickness 0.215" Maximum slip 0.87% Clutch single plate dry disc operated by foot pedal Seat pressed steel cushioned by rubber in torsion Brakes internal expanding shoes operated by two foot pedals located on right hand side of tractor Equalized by foot action Power take-off conventional type Steering aided by hydraulic power steering.

ENGINE Make Ford LPG Type 4 cylinder vertical Serial No. 850-L127727 Crankshaft mounted lengthwise Head I Lubrication pressure Bore and stroke 3.90" x 3.60" Rated rpm belt 2200 drawbar 2000 Compression ratio 8.0 to 1 Displacement 172 cu. in. Valve Port diameter Inlet 1.46" Exhaust 1.26" Governor variable speed centrifugal Carburetor size 1" Ignition system battery Starting system 6 volt battery Air cleaner oil washed wire mesh Muffler was used Oil filter full flow with replaceable paper element 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 97.0% of maximum belt horsepower.

TIRES, WHEELS AND WEIGHT

	Tests F, G, & H	Test J	Test K
Rear wheels			
Type	Pressed steel	Pressed steel	Pressed steel
Liquid ballast	383 lb each	None	None
Added cast iron	1080 lb each	None	None
Rear tires			
No. and size	Two 12-28	Two 12-28	Two 10-28
Ply	4	4	4
Air pressure	14 lb	14 lb	12 lb
Front wheels			
Type	Pressed steel	Pressed steel	Pressed steel
Liquid ballast	69 lb each	None	None
Added cast iron	104 lb each	None	None
Front tires			
No. and size	Two 6.00-16	Two 6.00-16	Two 6.00-16
Ply	4	4	4
Air pressure	28 lb	28 lb	28 lb
Height of drawbar	23 inches	24 inches	21 inches
Static weight			
Rear end	4856 lb	1930 lb	1850 lb
Front end	1665 lb	1320 lb	1314 lb
Total weight as tested with operator	6696 lb	3425 lb	3339 lb

HORSEPOWER SUMMARY

	Drawbar	Belt
1. Sea level (calculated) maximum horsepower (based on 60° F and 29.92" Hg)	37.37	41.72
2. Observed maximum horsepower (tests F and B)	35.16	39.55
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (ASAE and SAE ratings)	28.03	35.46

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 626.

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 throttle valve is 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 throttle control lever is set so that the governor will maintain rated engine speed when rated load is applied. Rated load is 85% of 100% maximum, as obtained in test B, corrected to standard conditions.

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.

TEST L: This torque test is run with wide open throttle. Loads are applied to reduce engine speed in approximately ten 5% increments. Rated speed equals 100%. The corresponding dynamometer torque is recorded as a per cent of torque at rated speed.

DRAWBAR HORSEPOWER TESTS

In all drawbar tests the pull exerted by the tractor is transmitted by a hydraulic pressure cylinder to a recording instru-

ment in the test car. When rubber tires are used, all tests are made on the concrete test course. All crawler type tractors are tested on a dirt test course which is maintained by grading, sprinkling and rolling so that it remains very nearly the same throughout the season. The same tires, wheels and weights are used for all tests except J and K.

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 this 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 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 16%. 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 load the throttle control lever is set to maintain rated engine speed. 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: Similar to test J except that the smallest tires and lightest wheels offered by the manufacturer are used.

