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1951

Test 458: McCormick Farmall Super C

Nebraska Tractor Test Lab

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The Experiment Station
University of Nebraska College of Agriculture
W. V. Lambert, Director, Lincoln, Nebraska

Department of Agricultural Engineering
Dates of test: May 31 to June 9, 1951
Manufacturer: INTERNATIONAL HARVESTER
COMPANY, CHICAGO, ILLINOIS
Manufacturer's rating: Not rated.

NEBRASKA TRACTOR TEST NO. 458

McCORMICK FARMALL SUPER C

BELT HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercury
		Gal per hour	Hp-hr per gal	Lb per hp-hour		Cooling med	Air	
TEST B—100% MAXIMUM LOAD—TWO HOURS								
23.67	1651	2.315	10.22	0.593	0.00	172	65	29.100
TEST C—OPERATING MAXIMUM LOAD—ONE HOUR								
22.92	1650	2.126	10.78	0.563	0.00	173	65	29.075
TEST D—RATED LOAD—ONE HOUR								
20.83	1652	1.983	10.50	0.578	0.00	170	65	29.075
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
20.90	1655	1.993	10.49	0.578	...	170	65
1.86	1799	0.959	1.94	3.129	...	134	65
10.88	1721	1.469	7.41	0.819	...	147	65
22.61	1625	2.082	10.86	0.559	...	170	64
5.62	1766	1.197	4.70	1.292	...	138	63
15.98	1685	1.750	9.13	0.665	...	155	63
12.98	1708	1.575	8.24	0.736	0.00	152	64	29.065

DRAWBAR HORSEPOWER TESTS

Hp	Draw bar pull lb	Speed miles per hr	Crank shaft speed rpm	Slip of drive wheels %	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercury
					Gal per hour	Hp-hr per gal	Lb per hp-hr		Cool- ing meu	Air	
TEST F—100% MAXIMUM LOAD—2ND GEAR											
20.72	2108	3.69	1651	5.59	—Not Recorded—				163	69	28.850
TEST G—OPERATING MAXIMUM LOAD											
17.45	3151	2.08	1653	15.71	—Not Recorded—				164	70	28.825
20.48	2080	3.69	1653	5.45	—Not Recorded—				161	70	28.825
20.34	1537	4.96	1656	3.70	—Not Recorded—				160	68	28.850
17.92	644	10.44	1648	1.87	—Not Recorded—				166	70	28.820
TEST H—RATED LOAD—TEN HOURS—2ND GEAR											
16.29	1637	3.73	1651	4.36	1.835	8.88	0.683	0.00	157	67	28.770
TEST J—OPERATING MAXIMUM LOAD—2ND GEAR											
17.80	1985	3.36	1657	16.33	—Not Recorded—				160	79	28.750
TEST K—OPERATING MAXIMUM LOAD—2ND GEAR											
14.54	1808	3.01	1653	14.15	—Not Recorded—				159	77	28.750

TIRES, WHEELS and WEIGHT

	Tests F, G, & H	Test J	Test K
Rear wheels			
Type	Cast spoke	Cast spoke	Cast spoke
Liquid ballast	368 lb each	None	None
Added cast iron	548 lb each	None	None
Rear tires			
No. and size	Two 10-36	Two 10-36	Two 7-36
Ply	4	4	4
Air pressure	14 lb	12 lb	12 lb
Front wheels			
Type	Cast spoke	Cast spoke	Cast spoke
Liquid ballast	None	None	None
Added cast iron	None	None	None
Front tires			
No. and size	Two 5.00-15	Two 5.00-15	Two 5.00-15
Ply	4	4	4
Air pressure	28 lb	28 lb	28 lb
Height of drawbar	18 inches	18½ inches	14 inches
Static weight			
Rear end	3876 lb	2044 lb	1928 lb
Front end	987 lb	990 lb	978 lb
Total weight as tested with operator	5039 lb	3209 lb	3081 lb

FUEL, OIL and TIME Gasoline octane No ASTM 76 Research 82 (rating taken from oil company's typical inspection data); weight per gallon 6.067 lb Oil SAE 20; to motor 1.281 gal; drained from motor 1.070 gal Total time motor was operated 40½ hours.

CHASSIS Type tricycle Serial No 71669 Tread width rear 47" to 80" front 6¾" Wheel base 82¼" Hydraulic control system direct engine drive Advertised speeds mph first 2¾ second 3¾ third 5 fourth 10¼ reverse 3 Belt pulley diam 8½" face 6" rpm 1363 Belt speed 3033 fpm Clutch single dry disk operated by foot pedal Seat upholstered seat on conical spring with hydraulic shock absorber Brakes double disk brake operated by two foot pedals Equalized by locking two brake pedals together Power take-off standard type.

ENGINE Make International Harvester Type 4 cylinder vertical Serial No FCM48245C122G Crankshaft mounted lengthwise Head I Lubrication pressure Bore and Stroke 3½" x 4" Rated rpm 1650 Compression ratio 6.00 to 1 Displacement 122.7 cu in Port Diameter Valves inlet 1 3/16" exhaust 1" Governor variable speed centrifugal Carburetor Size ¾" Ignition System 6 volt battery Starting System 6 volt electric Air Cleaner oil washed wire screen Muffler was used Oil Filter 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 were made with an operating setting of the carburetor (selected by the manufacturer) of 96.9% of maximum belt horsepower.

HORSEPOWER SUMMARY

	Draw-bar	Belt
1. Sea level (calculated)maximum horsepower (based on 60° F and 29.92" Hg)	21.67	24.45
2. Observed maximum horsepower (tests F & B)	20.72	23.67
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly ASAE and SAE ratings)	16.25	20.78

We, the undersigned, certify that this is a true and correct report of official tractor test No. 458.

L. F. LARSEN
Engineer in Charge

C. W. SMITH
F. D. YUNG
L. W. HURLBUT
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 preliminary period for limber up, general observation and adjustments. No data are recorded during this preliminary run.

BELT HORSEPOWER TESTS

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

TEST C: The manufacturer has an opportunity to select a more practical carburetor setting which may slightly lower the power output but give better fuel economy. As in test B, the throttle valve is held wide open and the load is adjusted to give the rated engine speed. Tests B and C may be the same, as in the case of a diesel engine where the manufacturer wants to use the same setting as in test B. The same setting is used for tests D, E, G, H, J and K.

TEST D: The throttle control lever is set so 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.

TEST E: This test serves to show how well the governor controls the engine speed when the following loads are applied: rated load, no load, $\frac{1}{2}$ load, maximum load at wide-open throttle, $\frac{1}{4}$ load and $\frac{3}{4}$ load. This test also shows some significant fuel consumption results for these loads. The average fuel consumption given for this test is quite significant. The average farm tractor is subjected to a varying load condition throughout the year.

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. All tests are made on the same 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: The tractor is operated in the gear designated by the manufacturer as rated gear (the gear recommended as most suitable for plowing). The carburetor is set as in test B. The throttle valve is held wide open and the drawbar load adjusted to maintain rated engine speed. Results of this test are used to determine the rated load for test H.

TEST G: The tractor is tested for maximum drawbar horsepower in each gear, using the more efficient carburetor setting as determined 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 the lower gears the tractor often is unable to develop maximum horsepower because of excessive wheel slippage. Then the load is reduced until slippage approaches 16%.

TEST H: This test lasts 10 hours and is the only drawbar test where fuel consumption is measured. The load applied is 75% of 100% maximum drawbar horsepower (test F) corrected to standard conditions. The throttle lever is set so that the governor gives rated engine speed.

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.

TEST K: Similar to test J except that the smallest tires and lightest wheels recommended by the manufacturer are used.

