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4-16-1951

Test 455: Massey-Harris Model 55

Nebraska Tractor Test Lab

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Department of Agricultural Engineering
Dates of test: April 16 to May 7, 1951.
Manufacturer: THE MASSEY-HARRIS COM-
PANY, RACINE, WISCONSIN
Manufacturer's rating: Not rated.

NEBRASKA TRACTOR TEST NO. 455

MASSEY-HARRIS 55

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								
66.91	1350	5.907	11.33	0.531	0.00	173	45	28.928
TEST C—OPERATING MAXIMUM LOAD—ONE HOUR								
63.50	1351	5.225	12.15	0.495	0.00	170	47	28.923
TEST D—RATED LOAD—ONE HOUR								
58.05	1350	4.810	12.07	0.498	0.00	170	52	28.900
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
57.99	1349	4.803	12.07	0.498	...	170	52
1.49	1460	1.531	0.97	6.181	...	162	53
31.52	1460	3.262	9.66	0.622	...	165	53
58.98	1343	4.833	12.20	0.493	...	172	53
16.11	1486	2.374	6.79	0.886	...	165	52
45.73	1414	4.055	11.28	0.533	...	170	54
35.30	1419	3.476	10.16	0.592	0.00	167	53	28.858

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 med	Air	
TEST F—100% MAXIMUM LOAD—3rd GEAR											
57.55	4135	5.22	1350	5.39	Not Recorded				177	74	28.865
TEST G—OPERATING MAXIMUM LOAD											
44.70	6377	2.63	1353	16.42	Not Recorded				160	73	28.850
54.95	4957	4.16	1351	7.01	Not Recorded				170	77	28.850
54.91	3928	5.24	1352	5.18	Not Recorded				169	73	28.860
50.52	1507	12.57	1354	1.76	Not Recorded				166	69	28.850
TEST H—RATED LOAD—TEN HOURS—3rd GEAR											
45.66	3252	5.26	1349	4.63	4.397	10.38	0.579	0.00	157	65	28.855
TEST J—OPERATING MAXIMUM LOAD—3rd Gear											
54.76	4066	5.05	1350	9.86	Not Recorded				160	66	28.860
TEST K—OPERATING MAXIMUM LOAD—3rd GEAR											
46.71	3866	4.53	1350	15.45	Not Recorded				158	63	28.860

TIRES, WHEELS AND WEIGHT

	Tests F, G, & H	Test J	Test K
Car wheels			
Type	Cast iron	Cast iron	Cast iron
Liquid ballast	785 lb each	None	None
Added cast iron	675 lb each	None	None
Rear tires			
No and size	Two 15-34	Two 15-34	Two 14-34
Ply	8	8	6
Air pressure	12 lb	12 lb	12 lb
Front wheels			
Type	Cast iron	Cast iron	Cast iron
Liquid ballast	None	None	None
Added cast iron	None	None	None
Front tires			
No and size	Two 750-18	Two 750-18	Two 750-18
Ply	4	4	4
Air pressure	28 lb	28 lb	28 lb
Height of drawbar	18½ inches	19 inches	17 inches
Static weight			
Rear end	8020 lb	5095 lb	4846 lb
Front end	2240 lb	2250 lb	2242 lb
Total weight as tested with operator	10,435 lb	7520 lb	7263 lb

FUEL, OIL and TIME Gasoline octane No ASTM 76 Research 82 (rating taken from oil company's typical inspection data); weight per gallon 6.015 lb Oil SAE 10; to motor 2.476 gal; drained from motor 1.949 gal Total time motor was operated 42 hours.

CHASSIS Type standard Serial No 55GS6184 Tread width rear 57" front 52" Wheel base 88½" Hydraulic control system none available Advertised speeds mph first 2.96 second 4.22 third 5.22 fourth 12.07 reverse 2.54 Belt pulley diam 16" face 8½" rpm 730 Belt speed 3059 fpm Clutch dry disc clutch operated by foot pedal Seat pressed steel on coil spring with shock absorber Brakes internal expanding shoe operated by two pedals on right hand side of tractor Equalized can be locked together Power take-off standard type.

ENGINE Make Massey-Harris Type 4 cylinder vertical Serial No MJA382G8726 Crankshaft mounted lengthwise Head 1 Lubrication pressure Bore and Stroke 4½" x 6" Rated rpm 1350 Compression ratio 5.82 to 1 Displacement 382 cu in Port Diameter Valves inlet 1.609" exhaust 1.489" Governor variable speed centrifugal Carburetor Size 1¼" Ignition System battery Starting System 6 volt electric Air Cleaner oil washed wire mesh 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 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 and K were made with an operating setting of the carburetor (selected by the manufacturer) of 95.1% of maximum belt horsepower.

HORSEPOWER SUMMARY

	Draw- bar	Belt
1. Sea level (calculated) maximum horsepower (based on 60° F and 29.92" Hg)	60.45	68.20
2. Observed maximum horsepower (tests F and B)	57.55	66.91
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)	45.34	57.97

We, the undersigned, certify that this is a true and correct report of official tractor test No. 455.

L. F. Larsen
Engineer in Charge

C. W. Smith
F. D. Yung
L. W. Hurlbut
Board of Tractor
Test Engineers

EXPLANATION OF TEST REPORT

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.

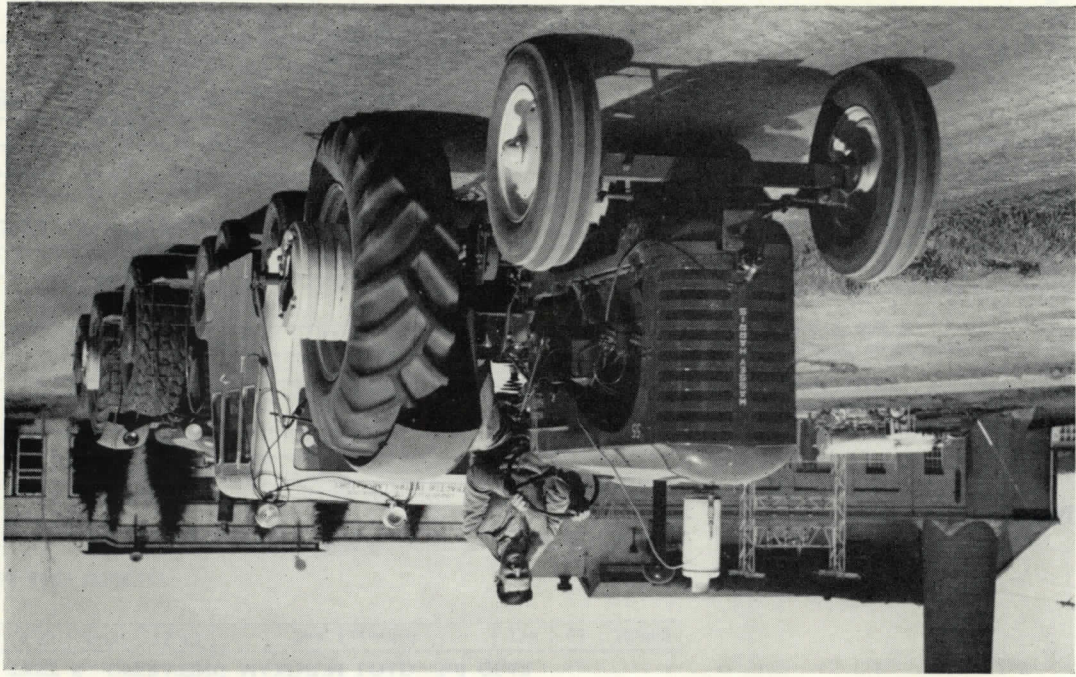
TEST F: The tractor is operated in the gear designated by the manufacturer as rated gear (the gear recommended as most suitable for plowing). The carburetor is set as in test B. The throttle valve is held wide open and the drawbar load adjusted to maintain rated engine speed. Results of this test are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



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

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, 1/2 load, maximum load at wide-open throttle, 1/4 load and 3/4 load. This test also shows some significant fuel consumption results for these loads. The average consumption given for this test is quite significant. The average farm tractor is subjected to a varying load condition throughout the year.