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January 1920

Test 005: Case 22-40

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UNIVERSITY OF NEBRASKA
 AGRICULTURAL ENGINEERING DEPARTMENT
 UNIVERSITY FARM, LINCOLN

Report of Official Tractor Test No. 5

Dates of test April 7 to May 6, 1920.

Name, model and rating of tractor Case 22-40

Serial No. Engine 32929 Serial No. Chassis Rated speed 850 RPM

Manufacturer J. I. Case Threshing Machine Co., Racine, Wis.

Tractor equipment used Bosch 3R4 Magneto. Kingston (F) Carburetor.

Style and dimensions of wheel lugs Spade 2- $\frac{3}{4}$ " high, \times 4" wide; 10" Extension rim

Brake Horse Power Tests

Horse Power Developed	Crank Shaft Speed R. P. M.	Length of Test Min.	Fuel Consumption			Water Consumption Gallons per Hour			Temperature *Cooling Fluid Deg. F.	Temperature of Atmosphere Deg. F.	Humidity %	Barometric Pressure Inches Mercury
			Kind of Fuel	Amount Used per Hour Gallons	Horse Power Hours per Gallon	In Radiator	In Fuel Mixture	Total				
RATED LOAD TEST												
40.08	856	120	Kero	4.115	9.72	none	0.74	0.74	180	60.5	56	28.8
Belt slippage 1.79%												
VARYING LOAD TEST **												
39.95	853.5	10	Kero									
39.86	787.5	10	"									
1.52	226.0	10	"									
10.48	892.0	10	"									
20.43	870.0	10	"									
30.53	867.5	10	"									
24.48	866.0	60	"	3.139	7.80	none	0.175	0.175	165	59	56	28.8
MAXIMUM LOAD TEST												
49.97	867	60	Kero	6.903	7.24	0.13	1.73	1.86	176	62	92	28.5
Belt slippage 1.97%												
HALF LOAD TEST												
23.65	867.4	60	Kero	2.999	7.88	none	none	none	177	57	68	28.7
Belt slippage 1.6%												

*Taken in discharge line from engine.

Remarks The kerosene used in brake horse power tests weighed 6.71 lbs per gallon.

** It was necessary to close the water feed to fuel mixture for 0, $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ loads in varying load test.

Report of Official Tractor Test No. 5

Drawbar Horse Power Tests

Horse Power Developed	Draw Bar Pull Pounds	Speed Miles per Hour	Crank Shaft Speed R. P. M.	Slippage of Drive Wheels %	Fuel Consumption			Water Used per Hour Gallons	*Temperature of Cooling Fluid Deg. F	Temperature of Atmosphere Deg. F.	Average Humidity %	Baromet. Pressur. Inches Mercury
					Ind of Fuel Used	Amount Used per Hour Gallons	Horse Power Hours per Gallon					
RATED LOAD TEST. TEN HOURS (10 Hrs. 2 Min)												
23.51	4180	2.11	852.5	13.53	Kero	3.844	6.13	***0.69	168	60	72	28.
MAXIMUM LOAD TEST (1st 142.3 ft; 2nd 140.3 ft)												
29.04	4965	2.19	950	19.25	Kero	---not	measured---		176	58	57	28.
31.27	3780	3.10	860	12.86	Kero	"	"		179	58	57	28.

*Taken to discharge line from engine.

Remarks The kerosene used in drawbar horse power tests weighed 6.80 lbs per gallon.

*** A small additional amount of water was used in the radiator which we failed to measure.

The rated load test and the first maximum test were made with the tractor in low gear. The second maximum test was made with the tractor in high gear.

** For calculating slippage, the circumference of drive wheels was taken at points of lugs.

Note 1. It should be noticed that the engine speed in the maximum test on low gear was 100 RPM above rated speed. This was due to incorrect adjustment of the overnor. If the speed had been at rating (850 RPM) the horse power developed would have been less.

Oil Consumption:

During the complete test consisting of about 53 hours running the following oil was used:

For the engine, 29 gallons of EB

For the transmission, none added.

Report of Official Tractor Test No. 5.

Miscellaneous Tests. None

Repairs and Adjustments. Endurance:

A new oil pump belt was put on May 5, to replace one which had broken after the tractor had run about 40 hours under test.

At the end of the test, the cylinder head was removed from cylinders 3 and 4. The copper gasket was found to be burned out for about half the distance between these two cylinders. It is our opinion that the defects indicated above are of only minor importance.

With the exceptions noted above the tractor was apparently in good condition at the end of the test and there was no evidence of undue wear in any part nor of any weakness which might call for early repairs.

Brief Specification Case 22-40 H.P. Tractor.

Engine: Four cylinder, vertical, valve-in-head. Bore 5-1/2", stroke 6-3/4", rated speed 850 r.p.m.

Chassis: Four wheel, rated speeds: low gear 2.2 mi. per hr., high gear 3.2 mi. per hr.

Total Weight, 9940 lbs.

General Remarks:

In the advertising literature submitted with the application for test of this tractor we find some statements and claims which cannot be directly compared with results of this test as reported above. It is our opinion that none of these statements or claims are unreasonable or excessive.

We, the undersigned, certify that above is a true and correct report of official tractor test No. 5.

Claude K. Shedd
Engineer-in-Charge

Oscar W. Jorgensen
E. E. Brackett
Giles W. Hansen