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January 1920

Test 001: Waterloo Boy N

Nebraska Tractor Test Lab

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UNIVERSITY OF NEBRASKA
AGRICULTURAL ENGINEERING DEPARTMENT
UNIVERSITY FARM, LINCOLN

Report of Official Tractor Test No. 1

Dates of test Mar. 31. to April 9, 1920.
 Name, model and rating of tractor Waterloo Boy, Model "N" 12-25 H.P.
 Serial No. Engine 19851 ~~Serial No. Chassis~~ Rated speed 750 R.P.M.
 Manufacturer Waterloo Gasoline Engine Co., Waterloo Iowa.
 Tractor equipment used Dixie #246 Mag. Schoebler Model D Carburetor.
 Style and dimensions of wheel lugs Angle 2 1/4" x 2 1/4" x 5/16" -- 16" long.

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 1													
25.51	771	120	Kero	3.28	7.78	x	x	0.46	177.2	61.9	36	28.6	
Belt slippage			1.64%	Radiator partly covered.									
VARYING LOAD TEST 2													
25.06	750	10	Kero.										
25.33	744	10	"										
20.99	713	10	"										
17.31	674	10	"										
12.31	739	10	"										
18.25	732	10	"										
14.88	758	60	"	2.35	6.31	x	x	0.21	176.0	61.7	68	28.5	
MAXIMUM LOAD TEST 3													
25.97	724	60	Kero	3.80	6.83	x	x	0.83	178.4	60.7	50	28.4	
Belt slippage			1.30%										
HALF LOAD TEST													
15.02	903	60	Kero	2.40	6.25				175.7	64.4	50	28.4	
Belt slippage			0.84%										

*Taken in discharge line from engine.

1. In the rated load test, with load constant, the speed increased from 768 at the beginning of the test to 794 at the end of 1 Hr. Remarks: 10 Min. A slight change in governor adjustment was then made, after which the slowest speed was 748 and the fastest speed was 774 r.p.m.
 2. It was necessary to shut off water feed to fuel mixture for 0, 1/4, 1/2 and 3/4 loads in the varying load test.
 3. In the maximum load test the governor was set the same as in the rated load test, which gave nearly, but not quite full opening of the governor valve at rated speed.
 x. The water for radiator and fuel mixture could not be measured separately.

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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 %	Barometric Pressure Inches Mercury
					ind of Fuel Used	Amount Used per Hour Gallons	Horse Power Hours per Gallon					
RATED LOAD TEST. TEN HOURS 10 Hours, 0 minutes.												
12.10	1982	2.29	778.5	11.84	kero.	2.858	4.23	0.19	160.6	49	60	28.7
Radiator partly covered 8:20 to 1:30 and again 6:00 to 7:42.												
MAXIMUM LOAD TEST (98.2 ft)												
15.98	2900	2.07	746	17.0	kero.	No record	No record		154	50	61	28.8

*Taken in discharge line from engine.

Remarks In computing slippage, the circumference of drive wheels was taken at points of lugs.
 Kerosene used for this test weighed 6.71 lbs per gal.
 Drawbar tests were made with tractor on low gear.

Oil Consumption:

During the complete test consisting of about 44 hours running the following oil was used:

For the engine, 3-3/8 gallons of Mobiloil A

For the transmission, None added during test. None used on final drive gear.

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Miscellaneous Tests:

At the beginning of the limbering up run the oil was drained from the crank case and 4-1/2 qts. of fresh oil put in. At the end of the limbering up run 5 qts. of oil was drained from the crank case, indicating that some fuel was passing the pistons unburned during this test.

Repairs and Adjustments. Endurance:

The valve tappet rods were adjusted on April 2, 1920 at the beginning of the rated load brake test. The tractor was in good condition at the close of this test. There was no evidence of undue wear in any part nor of any weakness which might call for early repairs.

Brief Specifications Waterloo Boy Model "N" 12-25 H.P. Tractor.

Engine: Twin cylinder, opposed cranks, horizontal, valve-in-head. Bore 6-1/2", stroke 7", rated speed 750 r.p.m.
Chassis: Four wheel. Rated speeds: low gear: 2.34 mi. per hr.
high gear 3.02 mi. per hr.
Total weight 6183 lbs.

General remarks:

The governor on this tractor did not give close regulation of the speed even with the load constant and on varying load the speed regulation was erratic. We do not consider this to be so serious a defect as to disqualify the tractor.

In the advertising literature submitted with the application for test of this tractor we find the following statement regarding the horse power capacity: "It has ample reserve power for prompt utility when needed". We do not approve this statement for the reason that it is indefinite and therefore likely to be misleading.

We also find in this advertising literature some claims and statements which cannot be directly compared with the results of this test as reported above. It is our opinion that none of these statements or claims are unreasonable or excessive except the following:

Page 2. "Drive internal gear, most efficient type----".

"Air taken from high level, insuring no dust."

Page 5. Air stack brings air to the carburetor from a high level -- no dust."

We, the undersigned, certify that above is a true and correct report of official tractor test No. 1.

Claude K. Shedd
Engineer-in-Charge

Oscar W. Sjogren
E. E. Bruchett
John W. Haney
Board of Tractor Test Engineers.