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January 1920

Test 041: Avery 12-20

Nebraska Tractor Test Lab

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UNIVERSITY OF NEBRASKA
AGRICULTURAL ENGINEERING DEPARTMENT
UNIVERSITY FARM, LINCOLN

Report of Official Tractor Test No. 41

Dates of test July 22, to August 2, 1920.

Name, model and rating of tractor Avery 12-20

Serial No. Engine 2 Serial No. Chassis 21196

Manufacturer The Avery Co., Peoria, Ill.

Tractor equipment used KW Model TK Mag; Kingston Model E Dual Carb.

Style and dimensions of wheel lugs Spud 2 $\frac{1}{4}$ " high x 3" wide, 6" extension rims.

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												
20.18	804	120	Kero	2.25	8.98	5.50	0.00	5.50	212	72	57	28.9
	Belt Slippage		1.35%									
VARYING LOAD TEST												
20.10	809	10	Kero									
20.79	796	10	"									
1.59	847	10	"									
5.28	841	10	"									
10.48	836.5	10	"									
15.75	835.5	10	"									
12.50	827.5	60	Kero	1.95	6.41	4.00	0.00	4.00	212	75	57	28.9
MAXIMUM LOAD TEST												
24.26	800	60	Kero	3.80	6.38	6.00	0.25	6.25	212	81	55	28.9
	Belt slippage		1.71%									
HALF LOAD TEST												
10.59	843	60	Kero	1.71	6.19	5.50	0.00	5.50	212	78	57	28.9
	Belt Slippage		1.23%									

*Taken in discharge line from engine.

Remarks Kerosene used for fuel in this test weighed 6.75 lbs per gallon.

In the varying load test the engine missed fire considerably on 0, $\frac{1}{4}$ and $\frac{1}{2}$ loads. This probably could have been prevented by using a richer fuel mixture.

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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 (9 Hr. 47 Min.)												
13.98	2238	2.34	820	12.0	Kero	3.29	4.25	6.44	211	81	55	28.9
MAXIMUM LOAD TEST (1st 124.6 ft; 2nd 133.0 ft.)												
17.58	2608	2.53	900	14.25	Kero	--- Not Recorded ----			210	83	54	28.9
13.77	1298	3.98	840	8.5	"	"	"		210	84	54	28.9

*Taken in discharge line from engine.

Remarks ** For computing slippage the circumference of the drive wheels was taken at points of lugs.

The ten-hour test and the first maximum test were made with the tractor in low gear; the second maximum test with the tractor in high gear.

Oil Consumption:

During the complete test consisting of about 30 hours running the following oil was used:

For the engine, 61 gallons of Mobiloil "B"

For the transmission, 1 gallons of Used oil on gears.

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Repairs and Adjustments. Endurance:

The clutch was adjusted once.

Copper tube from gasoline tank to carburetor broke and was repaired.

One intake valve spring broke and was replaced with a new spring.

At the end of the test the tractor was apparently in good condition. There was no indication of undue wear in any part nor of any weakness which might require early repairs.

Repairs and adjustments necessary during this test do not indicate any important mechanical defect in this model of tractor.

Brief Specifications Avery 12-20 H.P. Tractor.

Engine: Four cylinder, horizontal, opposed, valve-in-head.

Bore 4-3/8", stroke 6", rated speed 800 r.p.m.

Chassis: Four wheel. Rated speeds: Low gear 2-3/8 mi. per hr; high gear 3 1/2 mi. per hour.

Total weight 5500 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 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:

"Avery tractors have---motors---with---patented gasifiers that turn kerosene or distillate into gas and burn it all."

"---Avery---is the most "direct drive" transmission system built."

"Avery---is the---most efficient belt and drawbar transmission system built."

"---a larger percentage of the power developed by the motor in Avery tractor is delivered to the belt wheel and to the drawbar than in any other tractor built."

"---Avery opposed motors are superior to any tractor motor built."

"The opposed type of motor---is much better adapted for use in tractor work."

"The fuel system used on the Avery tractors from the 8-16 H.P. to the 40-80 H.P. size burns kerosene, distillate or any other low grade fuel more successfully than it has ever been done before."

"---Avery tractors are the simplest tractors built."

"Averys are the best all-around drawbar and belt tractors built."

We do not approve the comparisons with other tractors quoted above for the reason that proof is lacking.

We, the undersigned, certify that above is a true and correct report of official tractor test No. 41.

Claude K. Shedd
Engineer-in-Charge

Oscar W. Sjogren
E. E. Brackett
Fred R. Mohave
Board of Tractor Test Engineers.