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January 1923

Test 089: Avery "Track-Runner"

Nebraska Tractor Test Lab

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UNIVERSITY OF NEBRASKA
AGRICULTURAL ENGINEERING DEPARTMENT
UNIVERSITY FARM, LINCOLN

Report of Official Tractor Test No. **89**

Dates of test **March 16th to April 12th, 1923**

Name, model and rating of tractor **Avery "Track-Runner"**

Serial No. Engine **T.R.S. 534** Serial No. Chassis **35534**

Manufacturer **Avery Company, Peoria, Illinois.**

Tractor equipment used **K.W. Model T.K. (0133488) Magneto. Kingston "L" Carburetor.**

Style and dimensions of wheel lugs **Track runner with spiked grousers.**

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												
25.10	1121	120	Gas	3.045	8.24	0.46	0.00	0.461	151	73	69	28.66
				Belt	Slippage	0.70%						
** VARYING LOAD TEST												
25.10	1119	10	Gas						158	75		
26.13	1099	10	"						159	78		
1.06	1183.5	10	"						141	74		
6.64	1170	10	"	Average Belt Slippage 0.33%					132	70		
13.10	1152	10	"						137	74		
19.29	1136	10	"						145	76		
15.49	1143	60	"	2.331	6.64	0.23	0.00	0.23	145	74	69	28.58
*** MAXIMUM LOAD TEST												
29.44	1125	60	Gas	4.413	6.67	0.00	0.00	0.00	153	70	74	28.47
30.60	1121	60	"	4.675	6.55	0.03	0.00	0.03	150	69	74	28.47
HALF LOAD TEST												
12.75	1125	60	Gas	2.023	6.30	0.00	0.00	0.00	153	76	57	28.30
				Belt	Slippage	0.42%						

*Taken in discharge line from engine.

** The last line is the average for the hour.

REMARKS: *** The air cleaner was used in all tests except the second maximum brake test during which it was removed.

Belt slippage - First maximum 0.78%

Belt slippage - Second maximum 0.93%

REMARKS: The gasoline used for fuel in this test weighed 6.10 pounds per gallon.

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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
					Kind of Fuel Used	Amount Used per Hour Gallons	Horse Power Hours per Gallon					
RATED LOAD TEST. TEN HOURS												
15.16	1950	2.91	1124	2.46	Gas	3.287	4.61	0.237	140	61	48.0	28.90
MAXIMUM LOAD TEST												
18.15	2610	2.61	996	1.96	Gas	-----Not Recorded-----			138	58	55.0	28.85
20.13	3280	2.30	1165	2.44	"	"	"		146	60	55.0	28.85

*Taken in discharge line from engine.

15.85	1850	3.21	815	1.14	"	"	"		146	60	55.0	28.85
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Remarks

The distance advanced by the tractor without load on level earth for one complete revolution of the track, was used as a basis for computing track slippage. The first maximum test was run in second gear. The second maximum test was run in low gear and the third maximum test was run in high gear.

Oil Consumption:

During the complete test consisting of about 56 hours running the following oil was used:

For the engine, 21-1/2 gallons of Mobiloil "A" (1-1/2 gallons to fill crank case and 20 gallons were added)

For the transmission, None. gallons of

For the tracks, 4 gallons of used crank case oil.

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The following is a statement of all repairs and adjustments made on the tractor during the complete test. Also report on endurance:

March 21st:

Magneto timing advanced 3 degrees and breaker points dressed.
Governor spring distorted in adjusting, new spring installed.

March 29th:

After about three hours on the rated drawbar load two track rollers were lost from the right side and the track jammed. Eight broken rollers replaced. A few minutes later two track rollers were lost on the left side and the track jammed, bending the curved track frame. The frame was repaired and fifteen broken rollers replaced.

March 30th:

Two rollers were lost from the right track. Two additional pipes installed on each track lubricator. Track rollers inspected and 33 additional broken rollers found.

April 6th:

Complete set (352) new track rollers installed.

April 7th:

Twelve hour limber up run on new rollers.

April 9th:

Ground all engine valves. One valve spring found broken and was replaced. Magneto breaker points dressed.

April 10th:

Engine pistons removed. All rings indicated excessive wear; one ring found broken and three other rings found stuck in grooves. Full set of new rings installed. The appearance of all cylinders, pistons and rings indicated excessive abrasive action.

April 12th:

Lost one track roller from left side during maximum drawbar test.

With the exceptions noted above the tractor was in good working condition at the end of the test. The engine compression was normal and all track rollers were in good condition and there was no evidence of undue wear in any part nor of any weakness which might require early repairs.

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General remarks:

Brief Specifications Avery "Track-Runner" 15-25 H.P. Tractor.

Motor:- Own, four cylinder, 16 valves in head, removable cylinder sleeves; Bore - 4", Stroke - 5-1/2". Rated speed 1125 r.p.m.
"Pharo" governor.
"United" (whirling vane type) air cleaner.

Chassis:- Track layer type. Two front wheels. Disc clutch.
Rated speeds: Low gear 2.43 miles per hour, intermediate gear 2.93 miles per hour, high gear 3.9 miles per hour.

Total weight 5,600 pounds.

General Remarks:

In the advertising literature submitted with the application for the 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.

We, the undersigned, certify that above is a true and correct report of official tractor test No. 89.

E. E. Brackett
Engineer-in-Charge

Oscar W. Sjogren

C. W. Smith

Fred R. Nohavec

Board of Tractor Test Engineers.