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January 1920

Test 019: Minneapolis-Moline Twin City 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. 19

Dates of test June 3. to June 12, 1920.
 Name, model and rating of tractor Twin City 12-20
 Serial No. Engine 12137 Serial No. Chassis 12278
 Manufacturer Minneapolis Steel & Machinery Co., Minneapolis, Minn.
 Tractor equipment used Bosch DU 4 Magneto; Holly Carburetor.
 Style and dimensions of wheel lugs Angle 3½" high x 2½" x 24".

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												
20.32	1009	120	Kero	2.58	7.88	0.00	0.00	0.00	179	84	75	28.6
	Belt Slippage		1.19%									
VARYING LOAD TEST												
20.40	1013	10	Kero									
20.90	1003.5	10	"									
1.03	1077	10	"									
5.52	1065	10	"									
10.50	1049	10	"									
15.52	1023	10	"									
12.51	1037	60	Kero	2.09	5.98	0.00	0.00	0.00	174	87	76	28.6
MAXIMUM LOAD TEST												
27.93	1017	60	Kero	3.18	8.77	0.23	0.00	0.23	202	90	72	28.6
	Belt Slippage		1.54%									
HALF LOAD TEST												
10.30	1051	60	Kero	1.93	5.64	0.00	0.00	0.00	172	90	76	28.6
	Belt Slippage		1.00%									

*Taken in discharge line from engine.

Remarks Kerosene used for fuel in all tests on this tractor weighed
6.74 lbs 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
					Ind of Fuel Used	Amount Used per Hour Gallons	Horse Power Hours per Gallon					
RATED LOAD TEST. TEN HOURS												
13.86	1772	2.93	988	10.7	Kero	2.77	5.005	0.08	192	86	46	28.6
MAXIMUM LOAD TEST (1st 131.0'; 2nd 119.0')												
16.04	2061	2.92	1010	12.1	Kero	----- Not Recorded-----			182	83	55	28.7
18.43	3476	1.99	1000	20.1	"	" " "			200	83	55	28.7

*Taken in discharge line from engine.

Remarks ** For computing slippage, the circumference of the drive wheels was taken at points of lugs.
The tractor was operated in high gear in the 10-hour test and in the first maximum test and in
low gear in the second maximum test.

Oil Consumption:

During the complete test consisting of about 32 hours running the following oil was used:

For the engine, 3 gallons of Mobiloil "BB", 3 1/4 gal. Mobiloil "B", 1 gal. Veedol Extra Heavy.

For the transmission, none added gallons of

Report of Official Tractor Test No. 19.

Repairs and Adjustments. Endurance:

Valve tappets were adjusted once.

Copper tube fuel line was cut off $\frac{1}{2}$ " to repair leak.

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.

Brief Specifications Twin City 12-20 H.P. Tractor.

Engine: Four cylinder, vertical, valve-in-head, 16-valve. Bore $4\frac{1}{4}$ ", stroke 6". Rated speed 1000 r.p.m.

Chassis: Four wheel. Rated speeds: Low gear 2.2 mi. per hour, high gear 2.93 mi. per hour.

Total weight, 5000 lbs.

General Remarks:

In the advertising literature submitted with the application for test of this tractor we find the following claims regarding power capacity "---- engine actually develops power far beyond its rating." "----great surplus of power." These claims are not approved for the reason that they are indefinite.

We also find in this advertising literature 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:

"--- not only --- efficiently burning kerosene but--- transforming all of it into power".

We, the undersigned, certify that above is a true and correct report of official tractor test No. 19.

Clyde K. Shedd
Engineer-in-Charge

Oscar W. Jorgensen
E. E. Brackett
John W. Haney
Board of Tractor Test Engineers.