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January 1921

Test 081: Eagle 12-22

Nebraska Tractor Test Lab

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UNIVERSITY OF NEBRASKA AGRICULTURAL ENGINEERING DEPARTMENT

LINCOLN

Copy of Report of Official Tractor Test No. 81.

Dates of test: Aug. 18 to Sept. 21, 1921.

Name, model and rating of tractor: Eagle 12-22

Serial No. Engine: 1023 Serial No. Chassis: None.

Manufacturer: Eagle Manufacturing Co., Appleton, Wis.

Tractor equipment used: Schebler Mod. A Carburetor; Dixie Mod. 462 Magneto.

Style and dimensions of wheel lugs: Spade 3 3/8" x 2 1/4" at base; 3 1/4" high; concave faces.

BRAKE HORSE POWER TESTS

H.P.	Crank	Time	Dev.	Shaft	of	Speed	Test	R.P.M.	Min.	Fuel Consumption		H. P.	Hrs. @	Water Consump.		Temp. in	deg. F.	Air	Average Humidity %	Height of Barometer Inches
										Kind	Gals.			Gals. Per Hour	Cool-In	Cool-Fuel				

RATED LOAD TEST

22.41 : 507.5 : 120 : Kero. : 2.828 : 7.92 : 0.00 : 2.00 : 2.00 : 191 : 81 : 44 : 28.57
 Belt slippage 2.21%

** VARYING LOAD TEST

22.53 : 511.5 : 10 : Kero. : : : : : : : : : :
 22.79 : 501. : 10 : " : : : : : : : : : :
 1.38 : 555. : 10 : " : : : : : : : : : :
 6.07 : 547. : 10 : " : : : : : : : : : :
 11.85 : 535. : 10 : " : : : : : : : : : :
 17.31 : 521.5 : 10 : " : : : : : : : : : :
 ver. 14.01 : 528.5 : : : 2.155 : 6.50 : 0.00 : 0.75 : 0.75 : 178 : 83 : 44 : 28.57

MAXIMUM LOAD TEST

23.35 : 503. : 60 : Kero. : 3.183 : 7.34 : 0.00 : 2.125 : 2.125 : 191 : 90 : 44 : 28.57
 Belt slippage 2.34%

HALF LOAD TEST

12.08 : 545.5 : 60 : Kero : 2.2115 : 5.46 : 0.00 : 0.125 : 0.125 : 174 : 86 : 44 : 28.57
 Belt slippage 1.89%

*Taken in discharge line from engine

**The last line of this test is the average for the hour.

Remarks: The Kerosene used for fuel in this test weighed 6.76 pounds per gallon. After the first 20 minutes of the varying load test it was necessary to readjust hot and cold air dampers and water valve to carburetor to secure regular firing of engine.

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Drawbar Horse Power Tests

H. P.	Draw	Speed	Crank	Slip	Fuel Consumption	Water	Temp. Deg. F.	Height
Dev.	Bar	Miles	Shaft	on	Amt.	H.P. Used	*	of
	Pull	Per	Speed	Drive	Kind	per Hrs.	Cooling	Air
	Lbs.	Hour	R.P.M.	Wheels	Used	Hour	Fluid	Humidity
				%	Gals.	Gal.	Gals.	Barometer
								in "

Rated Load Test, Ten Hours

12.81	1553	3.09	469	**6.8	Kero	3.103	4.13	1.9	180	83	51	28.56
				***5.1								

Maximum Load Test

12.98	1665	2.92	442	**8.4	Kero	---	Not Recorded			72	45	28.68
				***3.6								
14.75	2715	2.04	475	**4.3	Kero	"	"			69	45	28.68
				***7.3								

* Taken in discharge line from engine

** At surface of wheel rim

*** At points of lugs.

Remarks: The rated load test and first maximum load test were run in high gear. The second maximum test was run in low gear.

Oil Consumption: During the complete test consisting of about 47 hours running the following oil was used:
For the engine, 4 gallons of Stanolind and 1 pound cup grease.
For the transmission, 3/4 gallon of 600 W and 1 pound of cup grease.

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Repairs and Adjustments:

Before any official data were taken:- magneto timing advanced; carburetor float readjusted; pistons were removed and replaced by higher compression type which will be standard for Nebraska. (The engine would not develop its rated brake horse power with the original pistons). During the rated drawbar horse power test the cotter pin in the end of the transmission drive shaft was sheared off or lost allowing the nut holding the right bull pinion to loosen and the shaft to move end-wise. Discovery was made before any damage resulted. At the end of the test threads on automatic grease cups on connecting rods were in bad condition probably due to the use of pipe wrench in tightening them after each filling to prevent them loosening when motor was running. Nut came loose on bolt holding control shifter fork crossbar, allowing shims to be lost; when tightened, the intermediate spur gear meshed too deep in the sliding gear shaft spur gear. Air intake pipe was increased to 3" diameter; two dampers in new pipe.

Except as noted above, the tractor was apparently in good condition at the end of the test.

Brief Specifications: Eagle 12-22.

Motor: own, twin cylinder, horizontal, valve-in-head; bore, 7"; stroke, 8"; rated speed, 500 r.p.m.

Chassis: 4 wheel; two speed and reverse sliding gear transmission; expanding shoe clutch. Rated speeds; high, 3 miles per hour; low, 2 miles per hour.

Total Weight: 6090 pounds.

General Remarks:

In the advertising literature and specifications 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 the test as reported above. It is our opinion that none of these claims are excessive or unreasonable, except the following:

Exhibit A - Specifications, Pages 8 and 9 - "Air cleaner - dry centrifugal." "Our air pipe opening being close enough to the exhaust practically keeps the air entering carburetor, free from dust."

Exhibit B - Page 5, Par. 2. - "Years of experience have shown that any twin-cylinder engine, if properly designed, will burn kerosene as perfectly as gasoline." "Eagle twin-cylinder engines burn kerosene perfectly."

Page 10, Par. 3. - "--- the speed of the motor is always kept constant."

Page 10, Par. 4. - "--- the motor governing perfectly at all speeds."

Page 15. - Description does not conform to specifications.

We, the undersigned, certify that above is a true and correct report of official tractor test No. 81.

E. E. Brackett
Engineer-in-Charge

1006-VI

Oscar W. Sjogren

C. W. Smith

Fred R. Nohavog
Board of Tractor Test Engineers