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January 1920

Test 015: Minneapolis 35-70

Nebraska Tractor Test Lab

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UNIVERSITY OF NEBRASKA
AGRICULTURAL ENGINEERING DEPARTMENT
UNIVERSITY FARM, LINCOLN

Report of Official Tractor Test No. 15

Dates of test May 21, to June 4, 1920.

Name, model and rating of tractor Minneapolis 35-70

Serial No. Engine 1647 Serial No. Chassis

Manufacturer Minneapolis Threshing Machine Co., Hopkins, Minn.

Tractor equipment used K.W. Model HT Magneto; Kingston Model E Carburetor

Style and dimensions of wheel lugs Prismoid Cleats, 1-3/4" high.

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												
10.31	556	120	Kero	8.83	7.96	x	x	5.00	203	73	70	28.6
	Belt Slippage		1.98%									
VARYING LOAD TEST												
70.06	354.5	10	Kero									
71.12	547.5	10	"									
1.97	625	10	"									
19.51	613.5	10	"									
31.27	603.5	10	"									
5.5	581	10	"									
4.25	57.5	60	Kero	6.34	6.97	x	x	2.00	194	71	70	.
MAXIMUM LOAD TEST												
24.01	556	60	Kero	9.97	7.42	x	x	4.50	203	65	70	28.6
	Belt Slippage		1.69%									
HALF LOAD TEST												
17.70	596	60	Kero	5.51	6.86	none	none	none	180	60	70	28.6
	Belt Slippage		1.60%									

*Taken in discharge line from engine.

Remarks Kerosene used in these brake tests weighed 6.74 lbs per gallon.

x Water for radiator and fuel mixture could not be measured separately.

It was necessary to re-adjust water feed to fuel mixture several times during the rated and maximum load tests. In the varying load test it was necessary to shut the water to fuel mixture off for no load and on it a little again for 3/4 load.

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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 %	Bar. Pr. In. Mer.
					Ind of Fuel Used	Amount Used per Hour Gallons	Horse Power Hours per Gallon					
RATED LOAD TEST. TEN HOURS (10 Hr. 2 Min)												
38.67	6910	2.10	556	7.4	Kero	7.27	5.32	1.91	175	68	44	28
MAXIMUM LOAD TEST (94.6 ft)												
52.55	10998	1.79	550	18.3	Kero	-----	No Record	-----	156	65	55	28

*Taken in discharge line from engine.

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

Kerosene used in these drawbar tests weighed 6.74 lbs per gallon.

Oil Consumption:

During the complete test consisting of about 1 1/2 hours running the following oil was used:

For the engine, 6 1/2 gallons of Mobiloil "22", 5 gallon Mobiloil "22", 1 gallon Polarine.

For the transmission, 3 1/2 gallons of Polarine Medium Heavy.

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Miscellaneous Tests: None.

Repairs and Adjustments. Endurance:

After 12 hours run the spark plugs were cleaned and fan belt re-laced.

After about 6 hours more the manufacturer's representative scraped the center crank shaft bearing cap a little because the bearing was running a little warm. He also ground down the exhaust valve stems a little to prevent sticking. Filed extra notches for governor control lever. Put new spark plug in cylinder No. 2 to replace one with broken porcelain.

The morning after the brake test had been completed when the engine was cranked up, it picked up speed rapidly for a few revolutions and then the clutch and belt wheel broke into many pieces which were thrown in various directions with great force. We were unable to determine the cause of this accident. New clutch and belt wheel were installed. New spark plug put in cylinder No. 3 to replace one with leak past porcelain.

At the end of the test the spark plug in cylinder No. 3 was dirty. Otherwise the tractor was in good condition. There was no indication of undue wear in any part nor of any weakness which might require early repairs.

The wrecking of the clutch and belt wheel would indicate a serious defect in this tractor if it were certain that the accident was due to weakness in these parts. Since it is possible that breakage of these parts was due to some cause not the fault of the tractor, it is our opinion that the tractor should not be disqualified because of this accident. No other mechanical defect of more than minor importance is indicated by the repairs and adjustments necessary during this test.

Brief Specifications Minneapolis 35-70 H.P. Tractor.

Engine: Four cylinder, horizontal, valve-in-head. Bore 7 $\frac{1}{4}$ ", stroke 9", rated speed 550 r.p.m.

Chassis: Four wheel. Rated speed 2.1 mi. per Hr.

Total weight 22500 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.

We, the undersigned, certify that above is a true and correct report of official tractor test No. 15.

Claude K. Shedd
Engineer-in-Charge

Oscar W. Jorgensen
E. E. Brachett
Gilbert W. Hancey
Board of Tractor Test Engineers.