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January 1931

## Test 186: Bates Steel Mule Model 35

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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UNIVERSITY OF NEBRASKA - AGRICULTURAL ENGINEERING DEPARTMENT  
AGRICULTURAL COLLEGE, LINCOLN

Copy of Report of Official Tractor Test No. 186

Dates of test: April 6 to 18, 1937.

Name and model of tractor: BATES STEEL MULE "35"

Manufacturer: Foote Bros. Gear and Machine Co., Chicago, Ill.

Manufacturer's rating: Drawbar - 35 H.P. Belt - 45 H.P.

Highest rating permissible under the recommendations of the A.S.A.E. and

S.A.E. Tractor Rating Codes: Drawbar - 32.91 H.P. Belt-46.90 H.P.

One carburetor setting (100% of maximum) was used thruout this test.

B R A K E H O R S E P O W E R T E S T S

H. P.	: Crank	:	Fuel Consumption	:	Water consumption	:	Temp.	:	
: shaft	:		:	: per hour	:	Deg. F.	:	Barometer	
: speed	:	Gals. :H. P.:Lbs. @	:	Cool- : In :	:	Cool- :	:	Inches of	
: R.P.M.:	:	per :hrs. @:H.P.	:	ing : fuel :Total	:	ing : Air:	:	Mercury	
:	:	: hour :gal. :hour	:	:	:	:med. :	:	:	

OPERATING MAXIMUM LOAD TEST. ONE HOUR

52.58	: 1498	:	6.395	:	8.22	:	0.738	:	0.00	:	0.00	:	0.00	:	179	:	72	:	28.865
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RATED LOAD TEST. ONE HOUR

45.18	: 1500	:	5.863	:	7.71	:	0.738	:	0.00	:	0.00	:	0.00	:	180	:	65	:	28.970
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\*VARYING LOAD TEST. TWO HOURS

45.11	: 1498	:	5.847	:	7.72	:	0.787	:	--	:	--	:	--	:	183	:	68	:	28.980
0.71	: 1531	:	2.451	:	0.29	:	20.957	:	--	:	--	:	--	:	173	:	71	:	--
22.71	: 1519	:	4.127	:	5.50	:	1.103	:	--	:	--	:	--	:	175	:	74	:	--
51.93	: 1479	:	3.455	:	8.04	:	0.754	:	--	:	--	:	--	:	184	:	77	:	--
11.82	: 1528	:	3.316	:	3.56	:	1.703	:	--	:	--	:	--	:	172	:	76	:	--
34.14	: 1500	:	4.987	:	6.85	:	0.887	:	--	:	--	:	--	:	176	:	76	:	--
28.00	: 1508	:	4.530	:	6.18	:	0.982	:	0.00	:	0.00	:	0.00	:	177	:	74	:	28.980

\*20 minute runs. Last line is average for two hours.

D R A W B A R H O R S E P O W E R T E S T S

	: Draw :	Speed :	Crank :	Slip :	Fuel Consumption :	Water :	Temp. :	
H. P.	: Bar :	miles :	shaft :	on :	:H.P. :	Lbs. :	used :	:Barometer
	: pull :	per :	speed :	drive:	Gal.:hr. :	per :	Gal. :	Cool-:Air:
	:pounds:	hour :	R.P.M.:	wheels:	per :per :	H.P. :	per :	ing :Inches of
	:	:	:	% :	hour:gal. :	hour :	hour :	med. :Mercury
	:	:	:	:	:	:	:	:

RATED LOAD TEST. TEN HOURS. Intermediate Gear.

35.43	: 4368	:	3.04	:	1496	:	0.89	:	5.556	:	6.38	:	0.947	:	0.00	:	190	:	73	:	28.750
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MAXIMUM LOAD TEST

43.73	: 8375	:	1.96	:	1499	:	4.43	:	-----	:	Not Recorded:-----	:	185	:	48	:	28.990
41.83	: 5147	:	3.05	:	1500	:	0.97	:	-----	:	" "	:	189	:	76	:	28.970
39.19	: 3475	:	4.23	:	1504	:	0.00	:	-----	:	" "	:	175	:	70	:	28.960

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AGRICULTURAL COLLEGE, LINCOLN

Copy of Report of Official Tractor Test No. 186

BRIEF SPECIFICATIONS

MOTOR: Make Waukesha Serial No. 275697 Type 6 Cylinder vertical  
Head L Mounting Lengthwise  
Bore and stroke: 4 1/4 x 4 3/4 in. Rated R.P.M. 1500  
Port Dia. Valves: Inlet 1 5/8" Exhaust 1 5/8"  
Belt pulley: Diam. 12 in. Face 9 in. R.P.M. 920  
Magneto: American Bosch Model U6  
Carburetor: Schebler Model HDX Size 1 1/2"  
Governor: Waukesha No. None Type Centrifugal  
Air Cleaner: Vortox Type Oil spray  
Lubrication: Pressure

CHASSIS: Type Tracklayer Serial No. 356001 Drive Enclosed gear  
Clutch: Twin Disc Type Dry Plate operated by hand  
Advertised speeds, miles per hour: Low 1.90  
Intermediate 2.85 High 3.80 Reverse 2.65  
Tracks: Length 18 ft. Face 12"  
Lugs: Type Cleats cast with shoe No. per track 36 Size 12" long x 2" high  
Extension rims: None  
Seat Upholstered  
Total weight as tested (with operator) 11218 pounds.

FUEL AND OIL:  
Fuel: Gasoline Weight per gallon 6.07 pounds on belt tests  
6.04 pounds on drawbar tests  
Oil: S. A. E. Viscosity No. 40  
Total oil to motor 2.195 gallons  
Total drained from motor 1.892 gallons  
Total time motor was operated 47 hours

The oil was drained  
from the crankcase  
once - at the end  
of the test.

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REPAIRS AND ADJUSTMENTS

No repairs or adjustments.

REMARKS

The tests herein reported were conducted with one carburetor setting which remained unchanged thruout the tests. This condition should be recognized when comparing this test with any Nebraska test conducted prior to 1928.

The track and lug equipment used in the drawbar tests is the same as that described on page 2 of this report.

In the advertising literature submitted with the specifications and application for test of this tractor we find no claims and statements which, in our opinion, are unreasonable or excessive.

We, the undersigned, certify that the above is a true and correct report of official tractor test No. 186.

Carlton L. Zink  
Engineer-in-charge

E. E. Brackett

C. W. Smith

E. B. Lewis  
Board of Tractor Test Engineers