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January 1937

Test 293: Massey-Harris Twin Power Challenger

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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4 Pages-Page 1

UNIVERSITY OF NEBRASKA - AGRICULTURAL ENGINEERING DEPARTMENT
 AGRICULTURAL COLLEGE, LINCOLN

Copy of Report of Official Tractor Test No. 293

Dates of test: October 25 to November 16, 1937.
 Name and model of tractor: MASSEY-HARRIS TWIN POWER CHALLENGER
 Manufacturer: Massey-Harris Company, Racine, Wisconsin.
 Manufacturer's rating: NOT RATED.

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

H. P.	Crank Shaft speed R.P.M.	Fuel Consumption			Water Consumption per hour gallons			Temp. Deg. F.		Barometer Inches of Mercury
		Gal. per hr.	H. P. hr. per gal.	Lb. per H. P. hr.	Cool- ing	In fuel	Total	Cool- ing med.	Air	

1200 R.P.M.

TEST B - 100% MAXIMUM LOAD - TWO HOURS

34.85	1200	3.713	9.39	0.649	0.016	0.000	0.016	204	87	28.750
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TEST C - OPERATING MAXIMUM LOAD - ONE HOUR

33.86	1201	3.238	10.46	0.582	0.015	0.000	0.015	195	77	28.765
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*TEST D - ONE HOUR

31.76	1200	3.151	10.08	0.604	0.000	0.000	0.000	183	68	28.750
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TEST E - VARYING LOAD - TWO HOURS (20 minute runs; last line average)

31.79	1201	3.143	10.11	0.602	--	--	--	182	65	--
0.63	1304	1.635	0.39	15.810	--	--	--	165	65	--
17.01	1281	2.340	7.27	0.838	--	--	--	167	65	--
32.24	1165	3.153	10.23	0.596	--	--	--	179	63	--
8.76	1298	2.020	4.34	1.404	--	--	--	166	62	--
24.77	1252	2.680	9.24	0.659	--	--	--	174	70	--
19.20	1250	2.495	7.70	0.791	0.000	0.000	0.000	172	65	28.770

1400 R.P.M.

TEST B - 100% MAXIMUM LOAD - TWO HOURS

40.73	1400	4.361	9.34	0.652	0.000	0.000	0.000	190	73	28.875
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TEST C - OPERATING MAXIMUM LOAD - ONE HOUR

39.36	1400	3.846	10.23	0.595	0.000	0.000	0.000	188	71	28.855
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*TEST D - ONE HOUR

36.27	1402	3.732	9.72	0.627	0.000	0.000	0.000	178	64	28.850
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TEST E - VARYING LOAD - TWO HOURS (20 minute runs; last line average)

36.22	1402	3.704	9.78	0.623	--	--	--	182	67	--
0.73	1498	1.837	0.40	15.329	--	--	--	164	64	--
18.92	1457	2.596	7.29	0.836	--	--	--	166	65	--
37.60	1349	3.685	10.20	0.597	--	--	--	181	66	--
9.73	1481	2.227	4.37	1.394	--	--	--	160	64	--
27.56	1418	3.030	9.10	0.669	--	--	--	171	66	--
21.79	1434	2.846	7.66	0.796	0.000	0.000	0.000	171	65	28.800

*Formerly called RATED LOAD; see REMARKS 4, page 4.

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

STEEL WHEELS

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

TEST F - 100% MAXIMUM LOAD - Second GEAR

25.52	2672	3.58	1196	8.17	----	Not Recorded	----	171	52	28.890
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TEST G - OPERATING MAXIMUM LOAD

24.34	3432	2.66	1205	7.99	----	Not Recorded	----	167	49	28.420
23.69	2449	3.63	1202	7.49	----	"	"	170	51	28.925
24.35	1983	4.61	1200	5.41	----	"	"	172	56	28.860
16.60	630	9.88	1199	2.15	----	"	"	170	58	28.870

*TEST H - TEN HOURS - Second GEAR

19.63	1999	3.68	1200	5.89	2.969	6.61	0.921	0.009	168	56	29.065
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FUEL ECONOMY TEST - FOUR HOURS - Third GEAR

19.93	1617	4.62	1200	5.03	3.009	6.62	0.920	0.000	170	60	28.770
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RUBBER TIRES

TEST G - OPERATING MAXIMUM LOAD

23.90	4009	2.24	1206	15.60	----	Not Recorded	----	166	33	28.890
29.23	3376	3.25	1200	9.17	----	"	"	167	32	28.930
29.83	2691	4.16	1201	6.52	----	"	"	166	30	28.960
27.10	1138	8.93	1200	3.29	----	"	"	166	30	28.980

FUEL ECONOMY TESTS - FOUR HOURS EACH - Second and Third GEARS

24.64	2777	3.33	1200	6.96	2.938	8.39	0.718	0.000	166	24	29.095
24.69	2202	4.20	1200	5.41	2.902	8.51	0.707	0.000	164	29	29.075

*Formerly called RATED LOAD; see REMARKS 4, page 4.

4 Pages-Page 3

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FUEL, OIL, AND TIME

Fuel Gasoline (68-70 octane) Weight per gallon (Belt, Steel 6.09 pounds
(Rubber 6.02 pounds

Oil: S.A.E. No. 20 To motor 3.534 gal; Drained from motor 2.366 gal.

Total time motor was operated 74 hours

BRIEF SPECIFICATIONS

Advertised speeds, miles per hour (steel wheels): First 2.4

Second 3.3 Third 4.1 Fourth 8.5 Reverse 3.0

Belt pulley: Diam. 12" Face 6 1/4" R.P.M. 832, 969

Clutch: Make Twin Disc Type Single-plate, dry Operated by Hand

Seat Pressed steel

Total weight as tested (with operator) (Steel 4570 pounds
(Rubber 5900 pounds

MOTOR: Make Own Serial No. 132107 Type 4 cylinder, vertical

Head I Mounting Crankshaft lengthwise Lubrication Pressure

Bore and stroke: 3 7/8" x 5 1/4" Rated R.P.M.: Drawbar 1200 Belt 1200, 1400

Port diameter valves: Inlet 1.375" Exhaust 1.5"

Magneto: Make American Bosch Model MJB4A - 306

Carburetor: Make Zenith Model 62-AX9 Size 1 1/8"

Governor: Make Kingston Type Variable-speed, centrifugal

Air Cleaner: Make Donaldson Type Oil-washed, wire screen filter

CHASSIS: Type Tricycle Serial No. 132578 Drive Enclosed gear

Tread width: Rear 52" - 80" Front: Top 11" Bottom 7"

Steel: Drive wheels: Type Standard No. 2 Diameter 52" Face 8"

Lugs: Type Spade No. per wheel 28 Size 5" high x 2 1/2" wide

Front wheels: Type Cast iron No. 2 Diameter 24" Face 4 1/2"

Rubber: Rear tires: No. 2 Size 11.25" x 36" Air pressure 16 pounds

Front tires: No. 2 Size 5.50" x 16" Air pressure 24 pounds

Added weight per wheel: Iron 575 pounds Water 375 pounds

REPAIRS AND ADJUSTMENTS

REMARKS

- We, the undersigned, certify that the above is a true and correct report of official tractor test No. 293.

E. E. Brackett

Ivan D. Wood

L. W. Hurlbut
Board of Tractor Test Engineers