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January 1938

## Test 304: Allis-Chalmers Model WC (Gasoline)

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. 304

Dates of test: June 2 to 16, 1938.

Name and model of tractor: ALLIS-CHALMERS WC (Gasoline)

Manufacturer: Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin.

Manufacturer's rating: NOT RATED.

B E L T 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 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 B - 100% MAXIMUM LOAD - TWO HOURS								
29.93	1300	2.861	10.46	0.589	0.000	166	77	28.950
TEST C - OPERATING MAXIMUM LOAD - ONE HOUR								
28.44	1300	2.455	11.58	0.532	0.000	175	83	29.005
*TEST D - ONE HOUR								
26.80	1300	2.321	11.55	0.534	0.000	171	84	29.000
TEST E - VARYING LOAD - TWO HOURS (20 minute runs; last line average)								
26.84	1299	2.328	11.53	0.534	--	170	85	--
0.72	1444	0.964	0.75	8.250	--	167	85	--
14.29	1382	1.622	8.81	0.699	--	173	85	--
27.28	1259	2.386	11.43	0.539	--	161	86	--
7.35	1426	1.276	5.76	1.069	--	168	86	--
20.86	1349	1.977	10.55	0.584	--	179	86	--
16.22	1360	1.759	9.22	0.668	0.000	173	85	28.995

\*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

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.		Barometer Inches of Mercury
					Gal. per hr.	H. P. per gal.	Lb. per H.P. hr.		Deg. F. Cool- ing med.	Air	

STEEL WHEELS

TEST F - 100% MAXIMUM LOAD - Second GEAR

22.29	2198	3.80	1300	4.94	-----	Not Recorded	-----	160	77	28.750
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TEST G - OPERATING MAXIMUM LOAD

19.77	2941	2.52	1296	8.09	-----	Not Recorded	-----	145	70	28.775
21.16	2071	3.83	1300	4.25	-----	"	"	160	72	28.635
20.13	1480	5.10	1301	4.03	-----	"	"	162	79	28.750

\*TEST H - TEN HOURS - Second GEAR

17.67	1727	3.84	1300	0.28	2.173	8.13	0.758	0.000	155	80	28.935
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FUEL ECONOMY TEST - FOUR HOURS - Third GEAR

17.00	1226	5.20	1300	0.04	2.223	7.65	0.805	0.000	163	86	28.740
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RUBBER TIRES

TEST G - OPERATING MAXIMUM LOAD

17.15	3136	2.05	1299	18.91	-----	Not Recorded	-----	130	59	29.025
22.48	2722	3.10	1300	15.91	-----	"	"	159	64	29.025
24.16	2017	4.49	1300	8.12	-----	"	"	164	68	29.035
23.52	976	9.04	1300	3.49	-----	"	"	171	68	29.050

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

19.05	2118	3.37	1299	8.29	2.013	9.46	0.651	0.000	151	74	29.045
20.10	1640	4.60	1299	5.87	2.099	9.58	0.643	0.000	152	72	29.050

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

FUEL, OIL, AND TIME

Fuel Gasoline Octane 70 Weight per gallon 6.16 pounds

Oil: S.A.E. No. 30 To motor 1.956 gal. Drained from motor 1.264 gal.

Total time motor was operated 63 hours

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BRIEF SPECIFICATIONS

Advertised speeds, miles per hour: First 2.50 Second 3.50

Third 4.75 Fourth 9.00 Reverse 2.00

Belt pulley: Diameter 9" Face 6 1/2" R.P.M. 1170

Clutch: Make Rockford Type Single-plate, dry Operated by foot pedal

Seat Pressed steel

Total weight as tested (with operator) (Steel wheels 3165 pounds  
(Rubber tires 4535 pounds)

MOTOR: Make Own Serial No. W67860HA Type 4 cylinder, vertical

Head I Mounting Crankshaft lengthwise Lubrication Pressure

Bore and stroke 4" x 4" Rated R.P.M. 1300

Port diameter valves: Inlet 1.50" Exhaust 1.3125"

Magneto: Make Fairbanks Morse Model F.M. 4B

Carburetor: Make Zenith Model 124-1/2 TOP Size 1 1/8"

Governor: Make Kingston Type Variable-speed, centrifugal

Air cleaner: Make United Type Oil-washed, wire-filter

CHASSIS: Type Tricycle Serial No. WC65625 Drive Enclosed gear

Tread width: Rear 65" and 76" Front (Steel: Top 12" Bottom 8"  
(Rubber: Top 13" Bottom 9")

Steel: Drive wheels: Type Standard No. 2 Diameter 40" Face 6"

Lugs: Type Spade No. per wheel 20 Size 5" high x 2" wide

Extension rims: Face 5" No lugs per rim none

Front wheels: Type Standard No. 2 Diameter 24" Face 4"

Rubber: Rear tires: No. 2 Size 11.25" x 24" - 4 ply Air pressure 12 pounds

Front tires: No. 2 Size 5.50" x 16" - 4 ply Air pressure 22 pounds

Added weight: Per rear wheel (Cast Iron 425 pounds  
(Calcium Chloride Solution 285 pounds)

Per front wheel (Cast Iron none pounds  
(Calcium Chloride Solution 22 pounds)

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REPAIRS AND ADJUSTMENTS

During the drawbar tests a small oil leak developed at the governor speed control lever bearing in the governor housing and another around the shift lever pivot pin in the transmission cover.

REMARKS

1. All results shown on pages 1 and 2 of this report were determined from observed data and without allowances, additions, or deductions. Tests B and F were made with carburetor set for 100% maximum belt horsepower and data from these tests were used in determining the horsepower to be developed in tests D and H, respectively. Tests C, D, E, G, and H were made with an operating setting of the carburetor (selected by the manufacturer) of 95.0% of maximum belt horsepower.
2. Observed maximum horsepower (tests F & B)      Drawbar 22.29    Belt 29.93
3. Sea level (calculated) maximum horsepower      Drawbar 23.58    Belt 31.43  
 (based on 60° F. and 29.92" Hg.)
4. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly A.S.A.E. and S.A.E. ratings).      Drawbar 17.69    Belt 26.72

We, the undersigned, certify that the above is a true and correct report of official tractor test No. 304.

Carlton L. Zink  
 Engineer-in-charge

E. E. Brackett

Ivan D. Wood

L. W. Hurlbut  
 Board of Tractor Test Engineers