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January 1938

Test 303: Allis-Chalmers Model WC (Distillate)

Tractor Museum

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UNIVERSITY OF NEBRASKA - AGRICULTURAL ENGINEERING DEPARTMENT
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Copy of Report of Official Tractor Test No. 303

Dates of test: May 31 to June 14, 1938.

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

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								
25.45	1300	2.611	9.75	0.707	0.000	177	81	28.740
TEST C - OPERATING MAXIMUM LOAD - ONE HOUR								
24.21	1300	2.202	10.99	0.627	0.000	184	84	28.740
*TEST D - ONE HOUR								
23.04	1300	2.103	10.96	0.629	0.000	181	87	28.740
TEST E - VARYING LOAD - TWO HOURS (20 minute runs; last line average)								
23.08	1301	2.107	10.95	0.629	--	183	89	--
0.86	1491	0.980	0.88	7.849	--	191	91	--
12.72	1432	1.576	8.07	0.854	--	185	90	--
23.21	1264	2.120	10.95	0.629	--	190	92	--
6.53	1468	1.267	5.15	1.337	--	186	91	--
18.45	1389	1.881	9.81	0.702	--	182	90	--
14.14	1391	1.656	8.54	0.807	0.000	186	90	28.740

*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. Deg. F.		Barometer Inches of Mercury
					Gal. per hr.	H. P. per gal.	Lb. per H.P. hr.		Cool- ing med.	Air	
STEEL WHEELS											
TEST F - 100% MAXIMUM LOAD - Second GEAR											
18.72	1841	3.81	1300	2.02	-----	Not Recorded	-----	180	83	29.000	
TEST G - OPERATING MAXIMUM LOAD											
18.04	2599	2.60	1302	2.84	-----	Not Recorded	-----	166	85	29.000	
17.12	1678	3.83	1300	1.65	-----	" "	-----	176	84	29.000	
14.98	1106	5.08	1300	1.61	-----	" "	-----	170	84	28.985	
*TEST H - TEN HOURS - Second GEAR											
14.81	1447	3.84	1301	4.29	1.944	7.62	0.904	0.015	178	79	28.880
FUEL ECONOMY TEST - FOUR HOURS - Third GEAR											
12.92	944	5.13	1301	3.55	1.973	6.55	1.052	0.000	174	86	28.735

RUBBER TIRES

TEST G - OPERATING MAXIMUM LOAD

17.27	3054	2.12	1307	17.04	-----	Not Recorded	-----	170	84	28.590	
20.16	2222	3.40	1301	8.02	-----	" "	-----	170	76	28.610	
20.41	1644	4.65	1300	5.12	-----	" "	-----	172	78	28.600	
18.76	763	9.22	1300	1.92	-----	" "	-----	174	80	28.600	
FUEL ECONOMY TESTS - FOUR HOURS EACH - Second and Third GEARS											
17.68	1925	3.44	1300	6.80	1.888	9.36	0.736	0.000	177	71	28.640
17.90	1439	4.67	1299	4.87	1.926	9.29	0.741	0.000	178	80	28.580

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

FUEL, OIL, AND TIME

Fuel Distillate Octane 35 Weight per gallon 6.89 pounds
 Oil: S.A.E. No. 30 To motor 3.738 gal. Drained from motor 3.842 gal.
 Total time motor was operated 58 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 3175 pounds
 (Rubber tires 4545 pounds)

MOTOR: Make Own Serial No. W67859K 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.H. 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. WC65623 Drive Enclosed gear

Tread width: Rear 65" and 76" Front (Steel: Top 12" Bottom 8"
 (Rubber: Top 15" 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 265 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 95.1% of maximum belt horsepower.
2. Observed maximum horsepower (tests F & B) Drawbar 18.72 Belt 25.45
3. Sea level (calculated) maximum horsepower Drawbar 19.73 Belt 27.03
(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 14.80 Belt 22.98

We, the undersigned, certify that the above is a true and correct report of official tractor test No. 303.

Carlton L. Zink
Engineer-in-charge

E. E. Brackett

Ivan D. Wood

L. W. Hurlbut
Board of Tractor Test Engineers