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Test 440: Allis-Chalmers WD

Nebraska Tractor Test Lab

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Department of Agricultural Engineering
 Dates of test: May 17 to June 1, 1950.
 Manufacturer: ALLIS-CHALMERS MANUFACTURING CO., MILWAUKEE, WISCONSIN
 Manufacturer's rating: Not rated.

The Experiment Station
 University of Nebraska College of Agriculture
 W. V. Lambert, Director, Lincoln, Nebraska

NEBRASKA TRACTOR TEST NO. 440

ALLIS-CHALMERS WD

BELT HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer in Hg
		Gal per hour	Hp-hr per gal	Lb per hp-hour		Cooling med	Air	
TEST B—100% MAXIMUM LOAD—TWO HOURS								
34.63	1400	3.219	10.76	0.565	0.00	160	61	28.963
TEST C—OPERATING MAXIMUM LOAD—ONE HOUR								
32.57	1399	2.770	11.76	0.517	0.00	166	62	28.980
TEST D—RATED LOAD—ONE HOUR								
30.55	1400	2.620	11.66	0.521	0.00	178	60	29.030
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
30.62	1403	2.635	11.62	0.523	...	177	58
1.85	1612	1.165	1.59	3.827	...	200	60
16.84	1537	1.930	8.73	0.697	...	195	62
32.02	1352	2.704	11.84	0.513	...	160	61
8.63	1573	1.510	5.72	1.064	...	195	63
23.97	1464	2.260	10.61	0.573	...	180	66
18.99	1490	2.034	9.34	0.651	0.00	185	62	29.035

DRAWBAR HORSEPOWER TESTS

Hp	Draw bar pull lb	Speed miles per hr	Crank shaft speed rpm	Slip of drive wheels %	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer in Hg
					Gal per hour	Hp-hr per gal	Lb per hp-hr		Cooling med	Air	
TEST F—100% MAXIMUM LOAD—3rd GEAR											
30.23	2369	4.79	1397	5.90	Not Recorded			150	74	28.930	
TEST G—OPERATING MAXIMUM LOAD											
25.02	4304	2.18	1399	17.35	Not Recorded			158	74	28.770	
27.41	2918	3.53	1400	8.18	" "			165	79	28.750	
27.76	2159	4.82	1400	5.36	" "			150	75	28.750	
26.56	1037	9.61	1404	1.90	" "			150	76	28.750	
TEST H—RATED LOAD—TEN HOURS—3rd GEAR											
23.56	1818	4.86	1402	4.73	2.363	9.97	0.610	0.00	173	62	28.937
TEST J—OPERATING MAXIMUM LOAD—3rd GEAR											
28.25	2279	4.65	1400	10.31	Not Recorded			150	73	28.930	

FUEL, OIL and TIME Gasoline octane No ASTM 76 Research 82 (rating taken from oil company's typical inspection data); weight per gallon 6.079 lb Oil SAE 20; to motor 1.507 gal; drained from motor 1.428 gal Total time motor was operated 40½ hours.

CHASSIS Type tricycle Serial No WD48595 Tread width rear 55 9/16" to 90¼" front 8¾" Wheel Base 88½" Hydraulic control system direct engine drive when hand clutch is used Advertised speeds mph first 2½ second 3¾ third 5 fourth 9¾ reverse 2¼ Belt pulley diam 9" face 6½" rpm 1260 Belt speed 2969 fpm Engine Clutch single dry plate operated by foot pedal Transmission Clutch over center wet double plate operated by hand lever Seat pressed steel seat on coil spring with hydraulic shock absorber Brakes external contracting operated by individual foot pedals Equalized none Power take-off direct engine drive when hand clutch is used.

ENGINE Make Allis-Chalmers Type 4 cylinder vertical Serial No WD247330 Crankshaft mounted lengthwise Head I Lubrication pressure Bore and Stroke 4" x 4" Rated rpm 1400 Compression ratio 5.75-1 Displacement 201 cu in Port Diameter Valves inlet 1.50" exhaust 1.32" Governor fly ball variable speed Carburetor Size 1" Ignition System magneto Starter 6 volt Air Cleaner oil washed wire screen Muffler used Oil Filter replaceable waste element Cooling medium temperature control thermostat and shutter.

REPAIRS AND ADJUSTMENTS No repairs or adjustments.

REMARKS All test results 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, H and J were made with an operating setting of the carburetor (selected by the manufacturer) of 94.1% of maximum belt horsepower.

TIRES, WHEELS and WEIGHT

	Tests F, G & H	Test J	Test K
Rear wheels			
Type	Pressed steel	Pressed steel	
Liquid ballast	216 lb each*	None*	
Added cast iron	952 lb each	None	
Rear tires			
No. and size	Two 11-28	Two 11-28	
Ply	6	6	
Air pressure	20 lb	12 lb	
Front wheels			
Type	Pressed steel	Pressed steel	
Liquid ballast	38 lb each	None	
Added cast iron	90 lb each	None	
Front tires			
No. and size	Two 5.50-16	Two 5.50-16	
Ply	4	4	
Air pressure	28 lb	28 lb	
Height of drawbar	22½ inches	23½ inches	
Static weight			
Rear end	4822 lb	2486 lb	
Front end	1306 lb	1050 lb	
Total weight as tested with operator	6313 lb	3721 lb	

* Note: Tractors are shipped from factory with calcium chloride solution in rear tires.

No smaller tires suggested by manufacturer.

HORSEPOWER SUMMARY

	Draw-bar	Belt
1. Sea level (calculated) maximum horsepower (based on 60° F and 29.92" Hg)	31.68	35.80
2. Observed maximum horsepower (tests F and B)	30.23	34.63
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly ASAE and SAE ratings)	23.76	30.43

We, the undersigned, certify that this is a true and correct report of official tractor test No. 440.

L. F. Larsen
 Engineer in Charge

C. W. Smith
 L. W. Hurlbut
 F. D. Yung
 Board of Tractor
 Test Engineers

