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Test 1044: Allis-Chalmers Crop Hustler 185 Diesel

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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NEBRASKA TRACTOR TEST 1044—ALLIS-CHALMERS CROP HUSTLER 185 DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crank- shaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
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MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—Two Hours (PTO Speed 605 rpm)								
74.87	2200	5.297	0.490	14.13	193	66	75	28.787

Standard Power Take-off Speed (540 rpm)—One Hour								
70.72	1962	4.854	0.476	14.57	193	68	75	28.780

VARYING POWER AND FUEL CONSUMPTION—TWO HOURS

67.46	2332	4.785	0.491	14.10	187	69	76	.....
0.00	2419	1.693	.....	.....	182	69	75	.....
34.44	2380	3.126	0.629	11.02	185	69	75	.....
74.89	2200	5.322	0.492	14.07	192	68	74	.....
17.30	2401	2.347	0.940	7.37	183	69	75	.....
51.15	2359	3.928	0.532	13.02	187	68	75	.....
Av 40.87	2348	3.533	0.599	11.57	186	68	75	28.780

DRAWBAR PERFORMANCE

Hp	Draw- bar pull lbs	Speed miles per hr	Crank- shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool- ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
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VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST

Maximum Available Power—Two Hours—4th Gear—(2nd Hi)											
63.82	5235	4.57	2201	8.41	5.318	0.577	12.00	187	65	69	28.780

75% of Pull at Maximum Power—Ten Hours—4th Gear (2nd Hi)											
52.91	3984	4.98	2337	6.01	4.449	0.583	11.89	181	54	63	28.981

50% of Pull at Maximum Power—Two Hours—4th Gear (2nd Hi)											
35.54	2658	5.16	2372	4.09	3.651	0.692	10.01	183	63	67	28.860

MAXIMUM POWER WITH BALLAST

44.88	7568	2.22	2342	14.86	2nd Gear (1st Hi)			181	67	77	28.760
62.17	6633	3.51	2201	11.50	3rd Gear (2nd Low)			190	68	75	28.760
65.07	5327	4.58	2199	8.17	4th Gear (2nd Hi)			190	68	77	28.760
63.43	4368	5.45	2201	6.51	5th Gear (3rd Low)			191	68	78	28.760
64.86	3502	6.95	2200	5.10	6th Gear (3rd Hi)			191	69	80	28.760
63.48	1944	12.25	2207	2.98	7th Gear (4th Low)			190	68	75	28.760

MAXIMUM PULL WITHOUT BALLAST

51.19	5382	3.57	2320	14.96	3rd Gear (2nd Low)			178	57	67	28.980
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VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—4th Gear (2nd Hi)

Pounds Pull	5327	5666	5839	5924	5917	5811
Horsepower	65.07	61.45	56.04	49.56	42.14	34.48
Crankshaft Speed rpm	2199	1970	1749	1530	1302	1084
Miles Per Hour	4.58	4.07	3.60	3.14	2.67	2.23
Slip of Drivers %	8.17	8.83	9.31	9.66	9.54	9.54

TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 18.4-28; 6; 16	Two 18.4-28; 6; 16
Ballast	—Liquid	953 lb each	None
	Cast iron	370 lb each	None
Front tires	—No, size, ply & psi	Two 9.5L-15; 6; 28	Two 9.5L-15; 6; 28
Ballast	—Liquid	None	None
	Cast iron	23 lb each	None
Height of drawbar		19½ inches	20 inches
Static weight with operator—Rear		7030 lb	4385 lb
	Front	2370 lb	2325 lb
	Total	9400 lb	6710 lb

Department of Agricultural Engineering

Dates of Test: May 26 to June 3, 1970

Manufacturer: ALLIS-CHALMERS MANUFACTURING COMPANY, MILWAUKEE, WISCONSIN

FUEL, OIL and TIME Fuel No 2 Diesel Cetane 50.8 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8322 Weight per gallon 6.928 lb Oil SAE 30 API service classification MS, DS To motor 2.240 gal Drained from motor 1.953 gal Transmission and final-drive lubricant Allis-Chalmers special lube oil Total time engine was operated 44 hours.

ENGINE Make Allis-Chalmers Diesel Type 6 cylinder vertical Serial No 2D-36629 Crankshaft mounted lengthwise Rated rpm 2200 Bore and stroke 3.87" x 4.250" Compression ratio 16.25 to 1 Displacement 301 cu in Cranking system 12 volt electric (two 12 volt batteries) Lubrication pressure Air cleaner dry type with replaceable pleated paper element Oil filter full flow replaceable paper cartridge Oil cooler radiator for hydraulic system Fuel filter one sediment bowl and one dual media replaceable cartridge Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No 185-1082D Tread width rear 60" to 84" front 53" to 73" Wheel base 99.16" Center of gravity (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 36.7" Vertical distance above roadway 29.0" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system direct engine drive Transmission selective gear fixed ratio plus operator controlled partial range power shifting Advertised speed mph first 1.99 second 2.50 third 4.03 fourth 5.06 fifth 5.91 sixth 7.43 seventh 12.79 eighth 16.06 reverse 3.68 and 4.62 Clutch single plate dry disc operated by foot pedal Brakes contracting band and disc operated by two foot pedals that can be locked together Steering hydrostatic power Turning radius (on concrete surface with brake applied) right 123" left 123" (on concrete surface without brake) right 139" left 139" Turning space diameter (on concrete surface with brake applied) right 261" left 261" (on concrete surface without brake) right 293" left 293" Power take-off 540 rpm at 1964 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with the SAE and ASAE test code. First gear was not run as it was necessary to limit the pull in second gear to avoid excessive wheel slippage. Eighth gear was not run as test procedure permits only one travel speed over 8 MPH.

We, the undersigned certify that this is a true and correct report of official Tractor Test 1044.

L. F. LARSEN

Engineer-In-Charge

G. W. STEINBRUEGGE

W. E. SPLINTER

D. E. LANE

Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
E. F. Frolik, Dean; H. W. Ottoson, Director; Lincoln, Nebraska

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories can be disconnected only when it is convenient for the operator to do so in practice. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of Automotive Engineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. Prior to the maximum power run the tire tread-bar height must be at least 65% of new tread height.

BELT OR POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representative makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the belt pulley or the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, $\frac{1}{2}$ of the 85% torque; maximum power. $\frac{1}{4}$ and $\frac{3}{4}$ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general usage.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effect of speed-control devices (engine, governor, automatic trans-

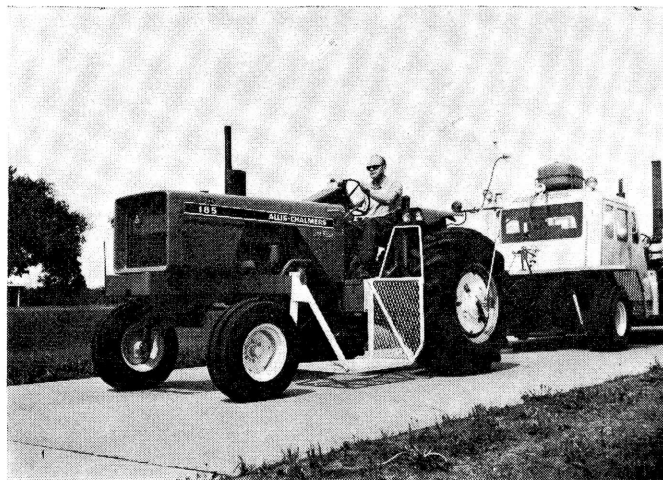
mission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; and (3) 50% of the pull at maximum power.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 8 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe-limit for the test course. The manufacturer's representative has the option of selecting one gear or speed over eight miles per hour. The maximum safe speed for the Nebraska Test Course has been set at 15 miles per hour. The slippage limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Maximum Pull without Ballast. All added ballast is removed from the tractor. The drawbar pull is determined at slip limits of 15% for pneumatic tires or 7% for steel tracks or lugs. The tractor is operated at the fastest possible travel speed.

Varying Drawbar Pull and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions: (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

For additional information about the Nebraska Tractor Tests write to the Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska 68503.



ALLIS-CHALMERS CROP HUSTLER 185 DIESEL