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Test 1167: Allis-Chalmers 7060 Diesel

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1167 – ALLIS-CHALMERS 7060 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
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1021 rpm)								
161.51	2300	10.179	0.436	15.87	190	63	75	28.790
Standard Power Take-off Speed (1000 rpm)—One Hour								
160.44	2252	10.036	0.432	15.99	191	62	75	28.780
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
142.73	2391	9.333	0.452	15.29	186	63	76	.....
0.00	2552	3.150	.....	.....	172	62	74	.....
74.06	2484	6.247	0.583	11.86	179	63	75	.....
161.78	2300	10.197	0.436	15.87	191	62	75	.....
37.57	2521	4.688	0.862	8.01	174	62	75	.....
109.28	2439	7.731	0.489	14.14	183	62	75	.....
Av 87.57	2448	6.891	0.544	12.71	181	62	75	28.750

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
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—8th Gear (4SL)											
136.12	10073	5.07	2300	5.33	9.984	0.507	13.63	183	54	60	29.015
75% of Pull at Maximum Power—Ten Hours—8th Gear (4SL)											
111.93	7784	5.39	2424	4.43	8.776	0.542	12.75	179	47	48	28.895
50% of Pull at Maximum Power—Two Hours—8th Gear (4SL)											
75.54	5058	5.60	2475	2.81	7.162	0.655	10.55	178	45	48	29.068
50% of Pull at Reduced Engine Speed—Two Hours—12th Gear (2FL)											
75.69	5065	5.60	1706	2.72	5.770	0.527	13.12	180	49	53	29.045

MAXIMUM POWER WITH BALLAST

89.60	17370	1.93	2427	14.86	2nd Gear (1SH)			179	40	47	29.030
140.06	11689	4.49	2300	6.19	6th Gear (1FH)			184	56	58	29.000
140.08	10364	5.07	2301	5.40	8th Gear (4SL)			184	56	60	29.000
138.25	9188	5.64	2300	4.69	9th Gear (3SH)			183	54	56	29.000
140.59	7595	6.94	2299	3.72	11th Gear (5SL)			182	54	57	29.000
133.91	5793	8.67	2302	2.81	13th Gear (5SH)			183	52	59	29.000

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—8th Gear (4SL)

Pounds Pull	10364	11354	12541	12791	12386	11215
Horsepower	140.08	137.62	133.25	118.90	98.56	75.66
Crankshaft Speed rpm	2301	2076	1836	1610	1375	1157
Miles Per Hour	5.07	4.55	3.98	3.49	2.98	2.53
Slip of Drivers%	5.40	5.95	6.73	7.04	6.88	6.27

TRACTOR SOUND LEVEL (with cab)

	db (A)
Maximum Available Power 2 Hours	78.5
75% of Pull at Max. Power 10 Hours	78.5
50% of Pull at Max. Power 2 Hours	79.0
50% of Pull at Reduced Engine Speed 2 Hours	76.5
Bystander 20th Gear (5FH)	88.0

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires		
Ballast	—No., size, ply & psi	Four 20.8-38;10;14
	—Liquid	787 lb each
	Cast Iron	629 lb each
Front tires		
Ballast	—No., size, ply & psi	Two 14L-16.1;6;24
	—Liquid	None
	Cast Iron	418 lb each
Height of drawbar	22 inches	22½ inches
Static weight with operator—rear	15790 lb	10125 lb
front	4700 lb	3865 lb
total	20490 lb	13990 lb

Department of Agricultural Engineering

Dates of Test: October 30, to November 11, 1974

Manufacturer: ALLIS-CHALMERS CORPORATION, MILWAUKEE WISCONSIN

FUEL, OIL AND TIME Fuel No 2 Diesel Cetane No 51.9 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8300 Weight per gallon 6.911 lb Oil Allis-Chalmers Power Lube 7000 SAE 30 API service classification SE-CD To motor 3.820 gal Drained from motor 3.149 gal Transmission and final drive lubricant Allis-Chalmers Power Fluid 821 Total time engine was operated 49.5 hours.

ENGINE Make Allis-Chalmers Diesel Type 6 cylinder with turbocharger and intercooler Serial No 3D 27139 Crankshaft Mounted lengthwise Rated rpm 2300 Bore and stroke 4.25" x 5.0" Compression ratio 16 to 1 Displacement 426 cu in Cranking system 12 volt electric (four 12 volt batteries) Lubrication pressure Air cleaner two stage dry type with replaceable pleated paper primary and safety elements and precleaner Oil filter two full flow replaceable cartridges and one by-pass type with replaceable element Oil Cooler engine coolant heat exchanger for crankcase oil and radiator for transmission and hydraulic fluid Fuel filter replaceable cartridge Muffler vertical Cooling medium temperature control two thermostats.

CHASSIS Type standard Serial No 7060-1001 Tread width rear 112" to 128" front 65.6" to 89.5" Wheel base 106" Center of gravity (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 28.4" Vertical distance above roadway 36.6" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system direct engine drive Transmission selective gear fixed ratio with partial range operator controlled power shifting Advertised speeds mph first 1.7 second 2.1 third 3.4 fourth 3.8 fifth 4.2 sixth 4.7 seventh 4.7 eights 5.2 ninth 5.8 tenth 6.5 eleventh 7.1 twelfth 7.6 thirteenth 8.7 fourteenth 9.4 fifteenth 10.4 sixteenth 11.7 seventeenth 12.9 eighteenth 14.4 nineteenth 15.7 twentieth 19.4 reverse 3.2, 3.9, 7.1 and 8.7 Clutch multiple plate wet disc hydraulically actuated by foot pedal Brakes wet multiple discs operated hydraulically by two foot pedals that can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 144" left 144" (on concrete surface without brake) right 197" left 197" Turning space diameter (on concrete surface with brake applied) right 293" left 293" (on concrete surface without brake) right 417" left 417" Power take-off 1000 rpm at 2252 engine rpm and 1021 at 2300 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure.

First gear was not run as it was necessary to limit the pull in second gear to avoid excessive wheel slippage.

Third, fourth, fifth, seventh, tenth, twelfth, fourteenth, fifteenth, sixteenth, seventeenth, eighteenth, nineteenth and twentieth gears were not run as test procedure requires only six travel speeds.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1167.

L. F. LARSEN

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

D. E. LANE

Board of Tractor Test Engineers

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.

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 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 effects of speed-control devices (engine, governor, automatic transmission, 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 4 different runs 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; (3) 50% of the pull at maximum power; and (4) maintaining the same load and travel speed as in (3) by shifting to a higher gear and reducing the engine rpm.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 6 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.

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.

SOUND MEASUREMENT

Sound is recorded during each of the Varying Power and Fuel Consumption runs as the tractor travels on a straight section of the test course. The dB(A) sound level is obtained with the microphone located near the right ear of the operator. Bystander sound readings are taken with the microphone placed 25 feet from the line of travel of the tractor.

An increase of 10 dB(A) will approximately double the loudness to the human ear.

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



ALLIS-CHALMERS 7060 DIESEL