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Test 928: Alli-Chalmers 190 (Gasoline)

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 928 - ALLIS-CHALMERS ONE-NINETY GASOLINE

POWER TAKE-OFF PERFORMANCE

Hp	Crank- shaft speed rpm	Fuel Consumption		Hp-hr per gal	Temperature Degrees F			Barometer inches of Mercury	
		Gal per hr	Lb per hp-hr		Cooling medium	Air wet bulb	Air dry bulb		
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours									
75.37	2200	6.939	0.568	10.86	185	57	75	28.975	
Standard Power Take-off Speed (540 rpm)—One Hour									
70.18	1938	6.180	0.543	11.36	185	57	75	28.985	
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS									
67.21	2306	6.697	0.615	10.04	181	57	75	.....
0.00	2470	2.339	.....	.....	173	56	75	.....
34.81	2384	4.290	0.760	8.11	179	57	75	.....
75.46	2200	6.931	0.567	10.89	188	58	78	.....
17.73	2430	3.341	1.162	5.31	175	56	74	.....
51.39	2353	5.146	0.618	9.99	182	57	75	.....
Av	41.10	2357	4.791	0.719	8.58	179	57	75	28.997

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption			Temp Degrees F				Barometer inches of Mercury
					Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling med	Air wet bulb	Air dry bulb		
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST												
Maximum Available Power—Two Hours—4th Gear												
63.10	5477	4.32	2202	7.00	7.193	0.703	8.77	182	41	46	28.810	
75% of Pull at Maximum Power—Ten Hours—4th Gear												
50.84	4190	4.55	2286	5.53	6.199	0.752	8.20	178	50	50	28.752	
50% of Pull at Maximum Power—Two Hours—4th Gear												
36.12	2802	4.83	2373	3.44	4.817	0.823	7.50	183	41	45	28.745	
MAXIMUM POWER WITH BALLAST												
62.78	8753	2.69	2236	14.56	2nd Gear		187	38	42	28.870		
63.65	7004	3.41	2198	9.08	3rd Gear		181	40	47	28.850		
65.09	5666	4.31	2196	6.93	4th Gear		179	39	46	28.830		
65.39	4892	5.01	2198	5.96	5th Gear		181	39	46	28.840		
65.51	3915	6.28	2199	4.61	6th Gear		181	39	46	28.880		
63.48	2451	9.71	2201	2.99	7th Gear		182	40	47	28.850		
59.60	1605	13.93	2198	2.09	8th Gear		188	40	47	28.870		
MAXIMUM POWER WITHOUT BALLAST												
58.24	5342	4.09	2239	14.91	4th Gear		191	56	65	28.510		
VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—4th Gear												
Pounds pull				5666	5879	5955	5971	5856	5852			
Horsepower				65.09	60.30	54.82	48.15	40.02	33.85			
Crankshaft speed, rpm				2196	1966	1769	1549	1313	1110			
Miles per hour				4.31	3.85	3.45	3.02	2.56	2.17			
Slip of drivers, %				6.93	7.27	7.54	7.54	7.54	7.27			

TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 18.4-34; 8; 16	Two 18.4-34; 8; 16
Ballast	—Liquid	895 lb each	None
	—Cast iron	900 lb each	None
Front tires	—No, size, ply & psi	Two 7.50-16; 6; 28	Two 7.50-16; 6; 28
Ballast	—Liquid	None	None
	—Cast iron	None	None
Height of drawbar		19½ inches	21 inches
Static weight	—Rear	8810 lb	5225 lb
	—Front	2310 lb	2265 lb
Total weight with operator		11295 lb	7665 lb

Department of Agricultural Engineering

Dates of Test: NOVEMBER 9 TO NOVEMBER 16, 1965

Manufacturer: ALLIS-CHALMERS MANUFACTURING COMPANY, MILWAUKEE, WISCONSIN

FUEL, OIL and TIME Fuel regular gasoline Octane No Motor 85.2 Research 92.3 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.7410 Weight per gallon 6.168 lb Oil SAE 10W-30 API service classification MS, DM To motor 1.927 gal Drained from motor 1.523 gal Transmission and final-drive lubricant E.P. 80 Total time engine was operated 40 hours.

ENGINE Make Allis-Chalmers gasoline Type 6 cylinder vertical Serial No 2G-03003 Crankshaft mounted lengthwise Rated rpm 2200 Bore and stroke 3¾" x 4" Compression ratio 8.0 to 1 Displacement 265 cu in Carburetor size 1½" Ignition system battery Cranking system 12 volt electric Lubrication pressure Air cleaner dry type with replaceable pleated paper element Oil filter replaceable pleated paper cartridge Fuel filter sediment bowls with screens Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No 190 6955 Tread width rear 64" to 80" front 60" to 84" Wheel base 105¾" 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 wheel 31.6" Vertical distance above roadway 39.4" 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 operator controlled partial range power shifting Advertised speeds mph first 2.1 second 3.0 third 3.6 fourth 4.4 fifth 5.1 sixth 6.3 seventh 9.6 eighth 13.6 reverse 2.8 and 3.9 Clutch single plated dry disc operated by foot pedal Brakes contracting band and discs operated by two foot pedals which can be locked Steering hydraulic with power assist Turning radius (on concrete surface with brake applied) right 133" left 133" (on concrete surface without brake) right 156" left 156" Turning space diameter (on concrete surface with brake applied) right 281" left 281" (on concrete surface without brake) right 300" left 300" Belt pulley 1845 rpm at 2200 engine rpm diam 9" face 6⅞" Belt speed 4347 fpm Power take-off 540 rpm at 1937 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.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 928.

L. F. LARSEN

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

J. J. SULEK

D. E. LANE

Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
E. F. Frolik, Dean; H. H. Kramer, 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. The tire tread-bar height must be at least 65% of new tread height prior to the maximum power run.

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. If the manufacturer specifies a different rated crankshaft speed for drawbar operations, then the position of the manually operated governor control is changed to provide the high-idle speed specified by the manufacturer in the operating instructions.

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. Prior to 1958, fuel consumption data (10 hour test) were shown only for the pull obtained at maximum power for tractors having torque converters and at 75% of the pull obtained at maximum power for gear-type tractors.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 12 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 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 Power Without Ballast. All added ballast is removed from the tractor. The maximum drawbar power of the tractor is determined by the same procedure used for getting maximum power with ballast. The gear (or travel speed) is the same as that used in the 10-hour test.

Varying Power 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.



Allis-Chalmers One-Ninety Gasoline