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Test 684: Fordson Dexta 957 E

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 684 - FORDSON DEXTA DIESEL

The University of Nebraska Agricultural Experiment Station

W. V. Lambert, Director; Lincoln, Nebraska

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								
31.41	2000	2.030	0.453	15.47	178	55	75	28.820
Standard Power Take-off Speed (540 rpm)—One Hour								
26.07	1551	1.605	0.432	16.24	167	56	75	28.820
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
30.23	2264	2.067	0.479	14.63	165	58	76	.....
1.65	2267	0.775	3.291	2.13	114	56	72	.....
15.17	2271	1.301	0.601	11.66	126	57	74	.....
31.69	1999	2.076	0.459	15.26	156	58	77	.....
7.56	2263	0.972	0.901	7.78	118	57	74	.....
22.87	2281	1.644	0.504	13.91	139	58	78	.....
Av 18.20	2224	1.472	0.567	12.36	136	57	75	28.790

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank shaft speed rpm	% Slip of drive wheels	Fuel Consumption		Hp-hr per gal	Temp. Degrees F			Barometer inches of mercury
					Gal per hr	Lb per hp-hr		Cooling med	Air wet bulb	Air dry bulb	
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—3rd Gear											
27.03	2144	4.73	1999	4.45	2.048	0.531	13.20	157	48	58	28.560
75% of Pull at Maximum Power—Ten Hours—3rd Gear											
23.03	1654	5.22	2190	3.62	1.837	0.559	12.54	119	37	42	28.899
50% of Pull at Maximum Power—Two Hours—3rd Gear											
16.83	1173	5.38	2216	1.92	1.514	0.631	11.12	112	36	39	28.548
MAXIMUM POWER WITH BALLAST											
19.71	4362	1.69	2196	12.99	1st Gear	.....	132	40	46	28.670	
26.80	2883	3.49	2003	7.86	2nd Gear	.....	149	40	46	28.670	
27.57	2219	4.66	2002	5.96	3rd Gear	.....	138	40	46	28.670	
27.32	1734	5.91	2000	4.79	4th Gear	.....	135	40	46	28.670	
26.01	944	10.33	2005	2.48	5th Gear	.....	117	40	46	28.670	
MAXIMUM POWER WITHOUT BALLAST											
27.80	2256	4.62	1998	8.94	3rd Gear	.....	117	33	37	29.055	
VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—3rd Gear											
Pounds pull		2200	2300	2400	2400	2400	2450				
Horsepower		27.6	25.8	23.7	20.5	17.9	15.0				
Miles per hour		4.7	4.2	3.7	3.2	2.8	2.3				

TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 12.4-28;4;14	Two 12.4-28;4;12
Ballast	—Liquid	202 lb each	None
	—Cast iron	903 lb each	None
Front tires	—No, size, ply & psi	Two 5.50-16;4;32	Two 5.50-16;4;32
Ballast	—Liquid	50 lb each	None
	—Cast iron	149 lb each	None
Height of drawbar		22.5 inches	23 inches
Static weight	—Rear	4130 lb	1920 lb
	—Front	1695 lb	1298 lb
Total weight with operator		6000 lb	3393 lb

Department of Agricultural Engineering

Dates of Test: February 28 to March 16, 1959

Manufacturer: FORD MOTOR COMPANY, LTD.

DAGENHAM, ESSEX, ENGLAND

Manufacturer's Power Rating: Not Rated

FUEL, OIL and TIME Fuel No 2 Diesel Cetane No 51 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8418 Weight per gallon 7.009 lb Oil SAE 20-20W API service classification DG and MS To motor 1.837 gal Drained from motor 1.469 gal Transmission and final-drive lubricant SAE No 20W-30 Type HD Total time motor was operated 43½ hours.

ENGINE Make Ford Motor Company Ltd Diesel Type 3 cylinder vertical Serial No 1419112 Crankshaft mounted lengthwise Rated rpm 2000 Lubrication pressure Bore and stroke 3.50" x 5.00" Compression ratio 16.5 to 1 Displacement 144 cu in Cranking system 12 volt battery Air cleaner oil washed wire gauze Muffler was used Oil filter replaceable treated paper element Fuel filter one replaceable paper element Cooling medium temperature control thermostat.

CHASSIS Type Standard Serial No 1419112 Tread width rear 48" to 76" front 52" to 76" Wheel base 73½" Center of gravity (without operator and ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 29" Vertical distance above roadway 25" Horizontal distance from center of rear wheel tread 0" to the right or left Hydraulic control system driven by PTO shaft Advertised speeds mph first 1.56 second 3.64 third 4.80 fourth 6.14 fifth 10.49 sixth 17.33 reverse 2.54 and 7.51 Belt pulley diam 9" face 6½" rpm 1290 Belt speed 3039 fpm Clutch double plate dry disc clutch operated by foot pedal Brakes internal expanding shoe operated by two foot pedals Power take-off 536 rpm at 1550 engine rpm Steering no power assistance Turning radius (on concrete surface with brake applied) right 102" left 102" (on concrete surface without brake) right 120" left 120" Turning space diameter (on concrete surface with brake applied) right 210" left 210" (on concrete surface without brake) right 250" left 250".

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. The sixth gear was over 15 mph and therefore was not run.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No 684.

L. F. LARSEN

Engineer-in-Charge

L. W. HURLBUT
G. W. STEINBRUEGGE
J. J. SULEK
Board of Tractor
Test Engineers

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common useage. 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 manufacturers published recommendations. The manufacturers 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 manufacturers 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 pully 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, $\frac{1}{2}$ 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 useage.

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 transmissions, 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.



Fordson Dexta Diesel