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Test 844: Ford 2000 Super Dexta Diesel

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 844 - FORD 2000 SUPER DEXTA DIESEL

The University of Nebraska Agricultural Experiment Station

E. F. Frolik, Dean; H. H. Kramer, Director, Lincoln, Nebraska

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption		Hp-hr per gal	Temperature Degrees F			Barometer inches of Mercurv
		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								
38.83	2250	2.712	0.482	14.32	187	71	76	29.018
Standard Power Take-off Speed (540 rpm)—One Hour								
34.31	1810	2.214	0.445	15.50	185	71	75	29.010

VARYING POWER AND FUEL CONSUMPTION—TWO HOURS

34.07	2324	2.351	0.476	14.49	174	71	75	.....
0.00	2417	0.822	.....	.....	145	70	75	.....
17.31	2358	1.513	0.603	11.44	158	70	75	.....
39.14	2250	2.712	0.478	14.43	187	70	75	.....
8.73	2380	1.143	0.904	7.64	150	70	75	.....
25.66	2334	1.895	0.510	13.54	173	70	75	.....
Av 20.82	2344	1.739	0.577	11.97	164	70	75	29.008

DRAWBAR PERFORMANCE

Hp	Drawbar 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—3rd Gear											
32.25	2744	4.41	2254	7.97	2.621	0.561	12.30	209	76	95	28.818
75% of Pull at Maximum Power—Ten Hours—3rd Gear											
26.17	2102	4.67	2320	5.24	2.102	0.554	12.45	190	76	93	28.735
50% of Pull at Maximum Power—Two Hours—3rd Gear											
18.29	1423	4.82	2358	3.69	1.671	0.630	10.95	174	77	98	28.790

MAXIMUM POWER WITH BALLAST

30.58	4524	2.54	2323	14.85	2nd Gear	.....	182	70	80	28.805
32.89	2821	4.37	2250	8.54	3rd Gear	.....	198	76	90	28.855
33.02	2027	6.11	2249	6.00	4th Gear	.....	195	76	90	28.855
33.03	1515	8.18	2250	4.45	5th Gear	.....	197	76	90	28.855

MAXIMUM POWER WITHOUT BALLAST

31.72	2848	4.18	2268	14.45	3rd Gear	208	72	90	28.725
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VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—3rd Gear

Pounds pull	2821	2963	3101	3226	3337	3381	3323
Horsepower	32.89	30.92	28.41	25.95	22.57	19.19	14.97
Crankshaft speed rpm	2250	2023	1791	1575	1338	1119	891
Miles per hour	4.37	3.91	3.44	3.02	2.54	2.13	1.69
Slip of drivers %	8.54	8.93	9.71	9.71	10.76	10.48	10.76

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	325 lb each	None
	Cast iron	725 lb each	None
Front tires	—No, size, ply & psi	Two 5.50-16; 4; 32	Two 5.50-16; 4; 20
Ballast	—Liquid	32 lb each	None
	Cast iron	178 lb each	None
Height of drawbar		21 inches	22½ inches
Static weight	—Rear	4140 lb	2040 lb
	Front	1715 lb	1295 lb
Total weight with operator		6030 lb	3510 lb

Department of Agricultural Engineering

Dates of Test: June 19 to July 2, 1963

Manufacturer: FORD MOTOR COMPANY LTD., DAGENHAM, ESSEX, ENGLAND

Manufacturer's Power Rating: 39.5 PTO Horsepower (corrected to standard conditions)

FUEL, OIL and TIME Fuel No 2 Diesel Cetane No 56.7 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8289 Weight per gallon 6.902 lb Oil SAE 20-20W API service classification DS To motor 1.699 gal Drained from motor 1.401 gal Transmission and final-drive lubricant FORD hydraulic oil M-4864-B Total time engine was operated 44 hours.

ENGINE Make Ford Motor Company Ltd. Diesel Type 3 cylinder vertical Serial No 1624180 Crankshaft mounted lengthwise Rated rpm 2250 Bore and stroke 3.6" x 5.0" Compression ratio 17.4 to 1 Displacement 152.7 cu in Cranking system 12 volt electric (two 6 volt batteries) Lubrication pressure Air cleaner oil washed wire gauze Oil filter treated paper element in replaceable cartridge Fuel filter one replaceable paper element Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No 09B718283 Tread width rear 48" to 76" front 52" to 76" Wheel base 72.8" 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 29" Vertical distance above roadway 25" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system operating only while clutch is engaged Transmission selective gear fixed ratio Advertised speeds mph first 1.61 second 2.91 third 4.80 fourth 6.55 fifth 8.62 sixth 19.53 reverse 7.85 and 2.63 Clutch dry disc operated by single foot pedal Brakes internal expanding shoe operated by two foot pedals Steering no power steering Turning radius (on concrete surface with brake applied) right 106" left 106" (on concrete surface without brake) right 120" left 120" Turning space diameter (on concrete surface with brake applied) right 221" left 221" (on concrete surface without brake) right 249" left 249" Belt pulley 1115 rpm at 2000 engine rpm diam 10.25" face 6.5" Belt speed 3000 fpm Power take-off 540 rpm at 1810 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. Sixth gear was not run as it exceeded 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 844.

L. F. LARSEN

Engineer-in-Charge

L. W. HURLBUT, Chairman

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 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, $\frac{1}{2}$ 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-

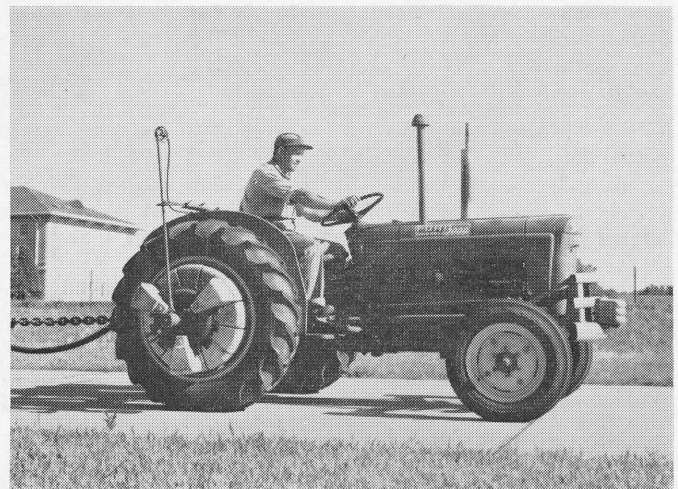
mission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the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



Ford Model 21203