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Test 1204: Ford 2600 Diesel 6-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1204-FORD 2600 DIESEL 6-SPEED

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								
32.38	Rated Engine Speed—Two Hours (PTO Speed—597 rpm)							
	2000	2.229	0.477	14.53	175	59	75	28.910
30.51	Standard Power Take-off Speed (540 rpm)—One Hour							
	1810	2.050	0.466	14.88	176	55	75	28.910
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
29.43	2139	2.111	0.497	13.95	165	54	75	.....
0.00	2251	0.792	.....	.....	152	54	75	.....
14.99	2179	1.375	0.636	10.90	157	54	75	.....
32.40	2001	2.232	0.478	14.52	173	54	75	.....
7.61	2211	1.055	0.962	7.21	154	56	75	.....
22.14	2145	1.696	0.531	13.06	161	57	75	.....
Av 17.76	2154	1.543	0.603	11.51	160	55	75	28.883

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Fuel Consumption			Hp-hr per gal	Temp Cooling med	Degrees F		Barometer inches of Mercury
				Slip of drivers %	Gal per hr	Lb per hp-hr			Air wet bulb	Air dry bulb	
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours 3rd Gear											
27.42	2554	4.03	1999	6.69	2.235	0.565	12.27	161	45	51	29.075
75% of Pull at Maximum Power—Ten Hours 3rd Gear											
22.72	1948	4.37	2136	5.17	1.936	0.591	11.74	164	67	74	28.562
50% of Pull at Maximum Power—Two Hours 3rd Gear											
15.65	1301	4.51	2177	3.95	1.532	0.679	10.22	151	51	62	28.800
50% of Pull at Reduced Engine Speed—Two Hours 4th Gear											
15.78	1314	4.50	1594	3.86	1.298	0.570	12.16	156	63	67	28.800
MAXIMUM POWER WITH BALLAST											
16.51	4591	1.35	2176	14.59	1st Gear			148	46	51	28.770
25.74	4318	2.24	1999	14.11	2nd Gear			168	63	67	28.603
27.69	2597	4.00	1999	7.37	3rd Gear			169	59	66	28.630
27.93	1880	5.57	1999	4.99	4th Gear			169	63	68	28.620
27.79	1399	7.45	2000	3.67	5th Gear			169	64	69	28.610

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—3rd Gear

Pounds Pull	2597	2732	2819	2863	2872	2816
Horsepower	27.69	26.01	23.84	21.23	18.23	14.99
Crankshaft Speed rpm	1999	1792	1598	1403	1203	1005
Miles Per Hour	4.00	3.57	3.17	2.78	2.38	2.00
Slip of Drivers %	7.37	7.63	8.03	8.14	8.24	7.93

TRACTOR SOUND LEVEL WITHOUT CAB db(A)

Maximum Available Power 2 Hours	94.5
75% of Pull at Max. Power 10 Hours	94.0
50% of Pull at Max. Power 2 Hours	94.5
50% of Pull at Reduced Engine Speed 2 Hours	91.0
Bystander (in 6th gear)	87.5

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 14.9-24; 4; 14	Two 14.9-24; 4; 14
	—Liquid	470 lb each	None
	Cast Iron	260 lb each	None
Front Tires	—No., size, ply & psi	Two 5.50-16; 4; 36	Two 5.50-16; 4; 36
	—Liquid	None	None
	Cast Iron (Front End)	90 lb total	None
Height of drawbar		22.5 inches	22.5 inches
Static weight with operator—	rear	4150 lb	2690 lb
	front	1840 lb	1750 lb
	total	5990 lb	4440 lb

Department of Agricultural Engineering

Dates of Test: March 15 to April 26, 1975

Manufacturer: FORD MOTOR COMPANY,
Tractor Operations, 2500 East Maple Road,
Troy, Michigan 48084

FUEL, OIL AND TIME Fuel No 2 Diesel Cetane No. 51.7 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8330 Weight per gallon 6.936 lb Oil SAE 30 API service classification SB/SE CA/CD To motor 1.476 gal Drained from motor 1.110 gal Transmission and final drive lubricant Ford M2C53A Total time engine was operated 72.0 hours

ENGINE Make Ford Type 3 cylinder vertical diesel Serial No. B018819 Crankshaft mounted lengthwise Rated rpm 2000 Bore and stroke 4.2" x 3.8" Compression ratio 17.3 to 1 Displacement 158 cu. in. Cranking system 12 volt Lubrication pressure Air cleaner oil bath wire mesh Oil filter full flow cotton blend spin-on cartridge Oil cooler radiator for hydraulic system Fuel filter nylon gauze in bottom of tank and paper element Muffler vertical Cooling medium temperature control thermostat

CHASSIS Type standard Serial No. C486279 Tread width rear 52.0" to 76.0" front 52.0" to 80.0" Wheel base 75.8" 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 32.8" Vertical distance above roadway 25.2" Horizontal distance from center of rear wheel tread 0" to the right/left Hydraulic control system direct engine drive Transmission selective gear fixed ratio Advertised speeds mph first 1.4 second 2.6 third 4.2 fourth 5.8 fifth 7.6 sixth 17.4 reverse 2.4 and 7.0 Clutch single plate dry disc operated by foot pedal Brakes internal expanding shoes operated by two foot pedals which can be locked together Steering power assist Turning radius (on concrete surface with brake applied) right 117" left 117" (on concrete surface without brake) right 129" left 129" Turning space diameter (on concrete surface with brake applied) right 240" left 240" (on concrete surface without brake) right 267" left 267" Belt pulley 1113 rpm at 2000 engine rpm diam. 10.25" face 6.5" Belt speed 2986 fpm Power take-off 540 rpm at 1810 engine rpm.

REPAIRS AND ADJUSTMENTS: Front wheel toe-in was adjusted previous to drawbar tests.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 136°F. Five gears were chosen between tangential pull limit of driving tires and 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1204.

LOUIS I. LEVITICUS

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

D. E. LANE

Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories may be disconnected only when the means for disconnecting can be reached from the operator station. 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 use.

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 mph. The slip 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 68583.



FORD 2600 DIESEL 6-SPEED