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Test 885: Ford 3000 Select-O-Speed (Gasoline)

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 885 - FORD 3000 SELECT-O-SPEED 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								
* 36.49	2100	3.343	0.557	10.92	194	61	78	28.780
Standard Power Take-off Speed (540 rpm)—One Hour								
33.69	1811	3.025	0.546	11.14	195	63	83	28.765
Standard Power Take-off Speed (1000 rpm)—One Hour								
35.30	1960	3.220	0.555	10.96	192	59	75	28.950
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS								
31.70	2148	2.915	0.559	10.87	192	63	84	.....
0.00	2308	1.312	.....	.....	184	63	84	.....
16.38	2219	2.195	0.815	7.46	190	62	83	.....
35.47	2101	3.245	0.557	10.93	195	63	84	.....
8.32	2256	1.751	1.280	4.75	186	63	83	.....
24.19	2183	2.540	0.639	9.52	192	63	84	.....
Av 19.34	2202	2.326	0.732	8.31	190	63	84	28.760

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	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—6th Gear											
29.76	2377	4.69	2096	4.68	3.112	0.636	9.56	198	62	77	28.940
75% of Pull at Maximum Power—Ten Hours—6th Gear											
23.72	1808	4.92	2169	3.35	2.733	0.701	8.68	194	57	74	28.883
50% of Pull at Maximum Power—Two Hours—6th Gear											
17.15	1264	5.09	2209	1.94	2.425	0.860	7.07	200	70	88	28.788

MAXIMUM POWER WITH BALLAST

20.26	5019	1.51	2168	13.11	3rd Gear	.....	189	58	69	28.930
26.64	4649	2.15	2102	10.57	4th Gear	.....	193	59	72	28.950
30.09	3139	3.59	2103	6.38	5th Gear	.....	193	60	73	28.950
29.81	2388	4.68	2096	4.82	6th Gear	.....	195	60	73	28.950
28.59	1967	5.45	2099	3.82	7th Gear	.....	197	60	73	28.950
28.43	1503	7.09	2105	2.92	8th Gear	.....	196	61	76	28.940
26.22	842	11.68	2107	1.42	9th Gear	.....	196	61	76	28.940

MAXIMUM POWER WITHOUT BALLAST

29.97	2423	4.64	2103	7.48	6th Gear	180	62	71	28.780
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VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—6th Gear

Pounds pull	2388	2511	2547	2623	2692	2622
Horsepower	29.81	28.16	25.21	22.62	19.91	16.07
Crankshaft speed, rpm	2096	1890	1670	1459	1253	1036
Miles per hour	4.68	4.21	3.71	3.23	2.77	2.30
Slip of drivers, %	4.82	5.04	5.36	5.69	5.79	5.47

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; 12
	Ballast	640 lb each	None
	Cast iron	795 lb each	None
Front tires	—No, size, ply & psi	Two 6.00-16; 4; 32	Two 6.00-16; 4; 28
	Ballast	None	None
	Cast iron	None	None
Height of drawbar		19½ inches	20½ inches
Static weight	—Rear	5140 lb	2270 lb
	Front	1625 lb	1670 lb
Total weight with operator		6940 lb	4115 lb

Department of Agricultural Engineering

Dates of Test: APRIL 8 TO APRIL 26, 1965

Manufacturer: FORD MOTOR COMPANY, BIRMINGHAM, MICHIGAN

FUEL, OIL and TIME Fuel regular gasoline Octane No 85.2 Research 92.3 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.7308 Weight per gallon 6.083 lb Oil SAE 10W API service classification MS, DM To motor 1.470 gal Drained from motor 1.271 gal Transmission Ford ESN M2C41A Final drive lubricant Ford ESN M2C77A Total time engine was operated 45½ hours.

ENGINE Make Ford gasoline Type 3 cylinder vertical Serial No NG002480L4 Crankshaft mounted lengthwise Rated rpm 2100 Bore and stroke 4.2" x 3.8" Compression ratio 8 to 1 Displacement 157.95 cu in Carburetor size 1¼" Ignition system battery Cranking system 12 volt electric Lubrication pressure Air cleaner dry type with replaceable pleated paper element Oil filter replaceable cotton blend element Oil cooler heat exchanger in lower radiator tank for transmission oil Fuel filter edge type filter in sediment bowl Muffler was used Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No C100387 Tread width rear 52" to 76" front 52" to 80" 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 centerline 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 with operator controlled full range power shifting Advertised speeds mph first 1.1 second 1.5 third 1.7 fourth 2.4 fifth 3.8 sixth 4.8 seventh 5.7 eighth 7.2 ninth 11.6 tenth 17.2 reverse 3.4 and 4.8 Clutch multiple disc wet clutches within transmission hydraulically operated Brakes internal expanding shoe operated by two foot pedals which can be locked Steering mechanical with 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 1085 rpm at 1950 engine rpm diam 1025" face 6.5" Belt speed 2911 fpm Power take-off 537 rpm at 1800 engine rpm and 995 rpm at 1950 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 and second gears were not run as it was necessary to limit the pull in third gear because of the stability formula. Tenth gear was not run because it exceeded 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 885.

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, $\frac{1}{2}$ 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 3000 Select-O-Speed Gasoline