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## Test 894: Ford 2000 8-Speed (Gasoline)

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 894 - FORD 2000 8-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								
* 30.85	1900	2.858	0.564	10.79	190	67	77	28.823
Standard Power Take-off Speed (540 rpm)—One Hour								
30.04	1810	2.783	0.564	10.79	192	69	84	28.810
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS								
27.48	1991	2.540	0.562	10.82	189	68	86	.....
0.00	2088	0.922	.....	.....	179	68	85	.....
14.00	2028	1.716	0.746	8.16	186	68	86	.....
30.71	1899	2.846	0.564	10.79	194	68	87	.....
7.09	2056	1.317	1.130	5.38	182	69	88	.....
20.70	2000	2.086	0.613	9.92	188	70	89	.....
Av 16.66	2010	1.904	0.695	8.75	186	68	87	28.780

## DRAWBAR PERFORMANCE

Hp	Draw- bar pull lbs	Speed miles per hr	Crank- shaft speed rpm	Fuel Consumption			Temp Degrees F				
				Slip of drivers %	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cool- ing med	Air wet bulb	Air dry bulb	Barom- eter inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—4th Gear											
26.49	2290	4.34	1909	6.25	2.824	0.649	9.38	195	70	83	28.680
75% of Pull at Maximum Power—Ten Hours—4th Gear											
22.03	1788	4.62	1998	4.62	2.390	0.660	9.22	193	68	73	28.631
50% of Pull at Maximum Power—Two Hours—4th Gear											
16.37	1302	4.72	2013	3.34	2.034	0.756	8.05	186	69	71	28.510
MAXIMUM POWER WITH BALLAST											
21.22	4377	1.82	1992	14.18	2nd Gear .....		195	50	59	29.040	
25.77	3134	3.08	1902	8.94	3rd Gear .....		195	64	75	28.650	
27.04	2350	4.31	1901	6.46	4th Gear .....		197	64	75	28.680	
27.15	2360	4.31	1900	6.30	5th Gear .....		196	65	75	28.680	
26.87	1455	6.93	1898	3.89	6th Gear .....		194	68	78	28.680	
25.12	799	11.79	1896	2.16	7th Gear .....		190	68	78	28.680	
MAXIMUM POWER WITHOUT BALLAST											
26.20	2337	4.20	1896	9.25	4th Gear .....		198	51	58	29.010	

## VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—4th Gear

Pounds pull	2350	2456	2536	2558	2546	2424
Horsepower	27.04	25.28	23.09	20.30	17.31	13.77
Crankshaft speed, rpm	1901	1707	1514	1322	1132	942
Miles per hour	4.31	3.86	3.41	2.98	2.55	2.13
Slip of drivers, %	6.46	6.77	7.08	7.08	7.08	6.66

## 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	370 lb each	None
	Cast iron	660 lb each	None
Front tires	—No, size, ply & psi	Two 5.50-16; 4; 32	Two 5.50-16; 4; 32
Ballast	—Liquid	None	None
	Cast iron	None	None
Height of drawbar		22½ inches	23 inches
Static weight	—Rear	4140 lb	2080 lb
	Front	1640 lb	1640 lb
Total weight with operator		5955 lb	3895 lb

Department of Agricultural Engineering

Dates of Test: MAY 1 TO MAY 11, 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 1.717 gal Drained from motor 1.438 gal Transmission and final-drive lubricant SAE 80 EP Total time engine was operated 43 hours.

**ENGINE** Make Ford gasoline Type 3 cylinder vertical Serial No LG002561L4 Crankshaft mounted lengthwise Rated rpm 1900 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 paper element Oil filter replaceable cotton blend element Fuel filter edge type filter in sediment bowl Muffler was used Cooling medium temperature control thermostat.

**CHASSIS** Type standard Serial No C100786 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 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 1.3 second 2.1 third 3.4 fourth 4.6 fifth 4.6 sixth 7.2 seventh 12.2 eighth 16.5 reverse 2.1 and 7.6 Clutch single plate dry disc in combination with pto clutch operated by single foot pedal 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 1057 rpm at 1900 engine rpm diam 10.25" face 6.5" Belt speed 2836 fpm Power take-off 537 rpm at 1800 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 because of the stability formula. Eighth 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 894.

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 2000 8-Speed Gasoline