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Test 1208: Ford 3600 Gasoline 6-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1208-FORD 3600 GASOLINE 6-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
40.17	2000	3.764	0.573	10.67	206	62	75	28.853
Standard Power Take-off Speed (540 rpm)—One Hour								
37.91	1810	3.375	0.545	11.23	207	62	75	28.880
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
36.29	2125	3.427	0.578	10.59	199	62	74	.....
0.00	2218	1.437	.....	.....	163	65	75	.....
18.40	2156	2.613	0.869	7.04	176	63	76	.....
40.53	2000	3.756	0.567	10.79	203	62	75	.....
9.33	2187	2.064	1.354	4.52	167	62	74	.....
27.26	2130	3.040	0.682	8.97	187	62	75	.....
Av 21.97	2136	2.723	0.758	8.07	182	62	75	28.887

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
34.35	3044	4.23	2000	8.09	3.697	0.659	9.29	201	60	69	28.955
75% of Pull at Maximum Power—Ten Hours 3rd Gear											
28.56	2333	4.59	2119	5.95	3.256	0.698	8.77	178	53	60	29.125
50% of Pull at Maximum Power—Two Hours 3rd Gear											
20.30	1594	4.78	2162	4.08	2.880	0.868	7.05	174	62	68	28.845
50% of Pull at Reduced Engine Speed—Two Hours 4th Gear											
20.16	1585	4.77	1585	3.99	2.451	0.744	8.23	181	65	72	28.840
MAXIMUM POWER WITH BALLAST											
33.32	5158	2.42	2047	14.77	2nd Gear			181	57	62	28.850
34.93	3098	4.23	1998	8.15	3rd Gear			197	51	62	29.050
35.53	2256	5.91	1999	5.76	4th Gear			196	54	65	29.000
35.29	1673	7.91	2000	4.14	5th Gear			194	57	67	28.980

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 3rd Gear

Pounds Pull	3098	3229	3291	3251	3281	3448	3250
Horsepower	34.93	32.68	29.45	25.51	22.09	19.47	14.72
Crankshaft Speed rpm	1998	1800	1595	1395	1201	1012	807
Miles Per Hour	4.23	3.80	3.36	2.94	2.53	2.12	1.70
Slip of Drivers %	8.15	8.58	8.68	8.47	8.79	9.21	8.68

TRACTOR SOUND LEVEL WITHOUT CAB

	dB(A)
Maximum Available Power 2 Hours	91.5
75% of Pull at Max. Power 10 Hours	91.5
50% of Pull at Max. Power 2 Hours	90.0
50% of Pull at Reduced Engine Speed 2 Hours	88.5
Bystander (in 6th gear)	80.0

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires	Two 16.9-24; 6; 16	Two 16.9-24; 6; 16
Ballast	654 lb each	None
	528 lb each	None
Front Tires	Two 6.00-16; 4; 32	Two 6.00-16; 4; 32
Ballast	20 lb each	None
	130 lb each	None
Height of drawbar	22 inches	22 inches
Static weight with operator—rear	5000 lb	2635 lb
front	1900 lb	1600 lb
total	6900 lb	4235 lb

Department of Agricultural Engineering

Dates of Test: March 25 to April 21, 1976

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

FUEL, OIL AND TIME Fuel no-lead gasoline Octane No. Motor 82.2 Research 91.8 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.7350 Weight per gallon 6.119 lb Oil SAE 10W-30 API service classification SB/SE CA/CB To motor 1.479 gal Drained from motor 1.329 gal Transmission and final drive lubricant Ford M-2C53-A Total time engine was operated 42.5 hours.

ENGINE Make Ford gasoline Type 3 cylinder vertical Serial No C019251 Crankshaft mounted lengthwise Rated rpm 2000 Bore and stroke 4.2" x 4.2" Compression ratio 7.75 to 1 Displacement 175 cu in Carburetor size 1 1/4" Ignition system battery Cranking system 12 volt Lubrication pressure Air cleaner dual paper element with dust evacuator Oil filter full flow cotton blend spin-on cartridge Oil cooler radiator for hydraulic oil Fuel filter edge type filter element Muffler vertical Cooling medium temperature control thermostat.

CHASSIS Type standard Serial No C483746 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 Advertised speeds mph first 1.4 second 2.6 third 4.2 fourth 5.8 fifth 7.6 sixth 17.4 reverse 2.0 and 7.0 Clutch single plate dry disc operated by foot pedal Brakes internal shoe 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 rpm diam 10.25" face 6.5" Belt speed 2986 fpm Power take-off 540 rpm at 1810 engine rpm.

REPAIRS and ADJUSTMENTS: During preliminary PTO run carburetor main jet No 532 was replaced by main jet No 552.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. During final inspection the #3 cylinder wall was found to be slightly scored. Four gears were chosen between 15% slip and 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1208.

L. I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
D. E. LANE

Board of Tractor Test Engineers

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 3600 GASOLINE 6-SPEED