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University of Nebraska - Lincoln

Year 1965

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Test 910: Farmall 1206

# NEBRASKA TRACTOR TEST 910 - FARMALL 1206 TURBO DIESEL

## POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft 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	
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>								
<b>Rated Engine Speed—Two Hours</b>								
112.64	2400	7.061	0.434	15.95	190	62	75	28.720
<b>Standard Power Take-off Speed (1000 rpm)—One Hour</b>								
106.63	2070	6.477	0.420	16.46	194	62	75	28.740
<b>VARYING POWER AND FUEL CONSUMPTION—TWO HOURS</b>								
101.29	2539	6.728	0.460	15.05	187	63	75	.....
0.00	2639	2.319	.....	.....	167	63	73	.....
51.73	2592	4.561	0.610	11.34	173	64	75	.....
112.59	2401	7.066	0.434	15.93	188	64	75	.....
26.12	2617	3.455	0.915	7.56	169	64	74	.....
76.67	2563	5.636	0.509	13.60	178	64	74	.....
Av 61.40	2558	4.961	0.559	12.38	177	63	74	28.727

## DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft 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	
<b>VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST</b>											
<b>Maximum Available Power—Two Hours—8th Gear (1st Hi-TA)</b>											
95.00	7756	4.59	2394	8.68	7.040	0.513	13.49	172	56	63	28.805
<b>75% of Pull at Maximum Power—Ten Hours—8th Gear (1st Hi-TA)</b>											
80.83	6086	4.98	2544	6.71	6.363	0.545	12.70	173	57	57	28.596
<b>50% of Pull at Maximum Power—Two Hours—8th Gear (1st Hi-TA)</b>											
54.99	3961	5.21	2585	4.07	5.159	0.649	10.66	174	57	64	28.740
<b>MAXIMUM POWER WITH BALLAST</b>											
86.15	10744	3.01	2543	14.82	5th Gear (3rd Lo-TA) 174		53	54	28.840		
95.00	9397	3.79	2398	11.16	6th Gear (3rd Lo-DD) 174		52	57	28.850		
96.21	9097	3.97	2399	10.82	7th Gear (4th Lo-TA) 174		53	54	28.840		
99.16	8108	4.59	2400	8.99	8th Gear (1st Hi-TA) 172		52	57	28.850		
97.10	6912	5.27	2403	7.52	9th Gear (4th Lo-DD) 173		52	57	28.850		
99.64	6191	6.04	2401	6.58	10th Gear (1st Hi-DD) 173		52	57	28.850		
99.44	5930	6.29	2403	6.28	11th Gear (2nd Hi-TA) 172		52	57	28.850		
99.46	4546	8.20	2403	4.49	12th Gear (2nd Hi-DD) 175		54	60	28.850		
98.25	3265	11.28	2404	3.02	13th Gear (3rd Hi-TA) 173		54	60	28.850		
95.35	2448	14.61	2411	2.31	14th Gear (3rd Hi-DD) 172		54	60	28.850		
<b>MAXIMUM POWER WITHOUT BALLAST</b>											
81.99	6559	4.69	2542	14.70	8th Gear (1st Hi-TA) 173		54	63	28.840		

<b>VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—8th Gear (1st Hi-TA)</b>						
Pounds pull		8108	8622	9213	9372	8898
Horsepower		99.16	93.98	87.91	77.67	53.33
Crankshaft speed, rpm		2400	2160	1911	1670	1197
Miles per hour		4.59	4.09	3.58	3.11	2.25
Slip of drivers, %		8.99	9.88	10.82	11.48	10.56

<b>TIRES, BALLAST and WEIGHT</b>		
	With Ballast	Without Ballast
<b>Rear tires</b>	—No, size, ply & psi	Two 18.4-38; 8; 16
<b>Ballast</b>	—Liquid Cast iron	1413 lb each 280 lb each None None
<b>Front tires</b>	—No, size, ply & psi	Two 7.50-16; 8; 36
<b>Ballast</b>	—Liquid Cast iron	None 40 lbs each None None
<b>Height of drawbar</b>		23½ inches
<b>Static weight</b>	—Rear Front	10345 lb 3060 lb
<b>Total weight with operator</b>		13580 lb

Department of Agricultural Engineering

Dates of Test: SEPTEMBER 8 to SEPTEMBER 23, 1965

Manufacturer: INTERNATIONAL HARVESTER COMPANY, CHICAGO, ILLINOIS

**FUEL, OIL and TIME** Fuel No 2 Diesel Cetane No 57.0 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.8312 Weight per gallon 6.920 lb Oil SAE 30 API service classification MS, DG, DM, DS To motor 2.795 gal Drained from motor 2.330 gal Transmission and final-drive lubricant IH Hy-Tran fluid Total time engine was operated 47 hours.

**ENGINE** Make International diesel Type 6 cylinder vertical with turbo-charger Serial No 10006 Crankshaft mounted lengthwise Rated rpm 2400 Bore and stroke 4¼" x 4.5" Compression ratio 17.0 to 1 Displacement 361 cu in Cranking system 12 volt electric (two 6-volt batteries) Lubrication pressure Air cleaner two stage dry type with replaceable pleated paper element Oil filter full flow replaceable treated paper element Oil cooler engine coolant heat exchanger for crankcase oil and radiator for transmission and hydraulic oil Fuel filter one primary and one final filter using replaceable paper elements Muffler was not used Cooling medium temperature control thermostat.

**CHASSIS** Type Standard Serial No 502 S-Y Tread width rear 56" to 94" front 50" to 74" Wheel base 104.8" 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 30.8" Vertical distance above roadway 37.6" 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 partial range operator controlled power shifting Advertised speeds mph first 1½ second 1¾ third 2 fourth 2½ fifth 3¼ sixth 4⅛ seventh 4¾ eighth 5 ninth 5½ tenth 6¼ eleventh 6½ twelfth 8½ thirteenth 11½ fourteenth 14½ fifteenth 15¼ sixteenth 19½ Reverse first 2½ second 3 third 3¼ fourth 4¼ fifth 5½ sixth 7¼ seventh 7½ eighth 9½ Clutch single plate dry disc operated by foot pedal Brakes dry disc hydraulically power actuated operated by two foot pedals Steering hydraulic with power assist Turning radius (on concrete surface with brake applied) right 131" left 131" (on concrete surface without brake) right 160" left 160" Turning space diameter (on concrete surface with brake applied) right 143" left 143" (on concrete surface without brake) right 172" left 172" Belt pulley none Power take-off 1014 rpm at 2100 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, second, third, and fourth gears were not run as it was necessary to limit the pull in fifth gear to avoid excessive wheel slippage. Fifteenth and sixteenth gears were not run as they exceeded 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 910.

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



Farmall 1206 Turbo Diesel