1-1-1976

Test 1213: White Field Boss 2-85 Diesel (Also White Farm Equipment 2-85 Diesel) 18-Speed

Nebraska Tractor Test Lab
University of Nebraska-Lincoln, tractortestlab@unl.edu

NEBRASKA TRACTOR TEST 1213 – WHITE FIELD BOSS 2-85 DIESEL
ALSO WHITE FARM EQUIPMENT 2-85 DIESEL
18 SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption 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								
Rated Engine Speed—Two Hours (PTO Speed—1007 rpm)								
85.54	2200	5.849	0.477	14.62	189	59	75	28.953
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
74.31	2252	5.126	0.481	14.50	185	59	75	.....
0.00	2360	1.915	.....	.....	177	59	75	.....
38.33	2315	3.477	0.632	11.02	179	59	75	.....
85.84	2200	5.926	0.481	14.48	188	60	75	.....
19.34	2337	2.685	0.968	7.20	178	59	74	.....
56.92	2292	4.304	0.527	13.23	180	59	75	.....
Av 45.79	**2293**	**3.905**	**0.595**	**11.72**	**181**	**59**	**75**	**28.923**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Fuel Consumption Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption 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											
Maximum Available Power—Two Hours 11th (4-D) Gear											
71.33	4688	5.71	2200	5.51	5.828	0.570	12.24	185	60	68	28.900
75% of Pull at Maximum Power—Ten hours 11th (4-D) Gear											
56.26	3513	6.01	2271	3.72	4.834	0.599	11.64	181	63	73	28.697
50% of Pull at Maximum Power—Two Hours 11th (4-D) Gear											
38.47	2334	6.18	2314	2.67	3.963	0.718	9.71	178	53	59	28.860
50% of Pull at Reduced Engine Speed—Two Hours 14th (5-D) Gear											
39.05	2359	6.21	1661	2.49	3.210	0.573	12.17	178	68	71	28.900
MAXIMUM POWER WITH BALLAST											
47.89	9309	1.93	2288	**14.70**	3rd (1-O) Gear			180	60	69	28.790
70.45	6580	4.02	2200	**8.27**	8th (3-D) Gear			186	66	71	28.830
71.67	5760	4.67	2199	**6.85**	9th (4-U) Gear			186	66	71	28.830
68.34	5203	4.93	2201	**6.17**	10th (3-O) Gear			186	66	70	28.840
71.17	4669	5.72	2200	**5.32**	11th (4-D) Gear			185	66	71	28.850
71.93	3319	8.13	2200	3.60	14th (5-D) Gear			186	67	73	28.800

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST
11th (4-D) Gear

Pounds Pull	4669	5106	5222	5381	5580	5581	5309
Horsepower	71.17	69.52	63.02	56.86	50.20	42.12	32.06
Crankshaft Speed rpm	2200	1978	1756	1543	1316	1105	880
Miles Per Hour	5.72	5.11	4.53	3.96	3.37	2.83	2.26
Slip of Drivers %	5.40	5.89	6.17	**6.30**	**6.44**	**6.58**	**6.30**

TRACTOR SOUND LEVEL WITH CAB	db(A)
Maximum Available Power 2 Hours	85.5
75% of Pull at Max. Power 10 Hours	84.5
50% of Pull at Max. Power 2 Hours	84.5
50% of Pull at Reduced Engine Speed 2 Hours	83.5
Bystander in 18th (6-O) Gear	89.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 18.4-34; 8; 20	Two 18.4-34; 8; 20
Ballast	—Liquid	None	None
	Cast Iron	270 lb each	None
Front Tires	—No., size, ply & psi	Two 11L-15; 6; 32	Two 11L-15; 6; 32
Ballast	—Liquid	None	None
	Cast Iron	**20 lb each**	None
Height of drawbar		21.5 inches	21.5 inches
Static weight with operator—rear		8980 lb	8440 lb
	front	3300 lb	3260 lb
	total	12280 lb	11700 lb

Department of Agricultural Engineering

Dates of Test: May 18 to June 1, 1976

Manufacturer: WHITE FARM EQUIPMENT COMPANY, 2625 Butterfield Road, Oak Brook, Illinois 60521

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 51.8 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8372 **Weight per gallon** 6.971 lb **Oil SAE** 30 **API service classification** SB/SE-CA/CD **To motor** 3.822 gal **Drained from motor** 3.337 gal **Transmission and final drive lubricant** SAE 80-90 **Total time engine was operated** 41.0 hours.

ENGINE: Make Perkins Diesel **Type** 6 cylinder vertical **Serial No.** 354U344459L **Crankshaft mounted** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.875″ x 5.00″ **Compression ratio** 16 to 1 **Displacement** 354 cu. in. **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two stage dry paper element with dust evacuator **Oil filter** full flow pleated paper cartridge **Oil cooler** radiator for hydraulic oil and Hydraul-shift oil **Fuel filter** two pleated paper elements **Muffler** vertical **Cooling medium temperature control** thermostat.

CHASSIS: Type standard **Serial No.** 263409-408 **Tread width** rear 68″ to 94″ front 60″ to 84″ **Wheel base** 109.625″ **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 31.2″ Vertical distance above roadway 35.3″ 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 (3) range operator controlled power shift **Advertised speeds mph** first 1.5 second 1.8 third 2.1 fourth 2.8 fifth 3.4 sixth 3.5 seventh 4.1 eighth 4.3 ninth 4.9 tenth 5.1 eleventh 5.9 twelfth 6.8 thirteenth 7.1 fourteenth 8.2 fifteenth 9.8 sixteenth 11.8 seventeenth 14.2 eighteenth 17.0 reverse 1.7, 2.0, 2.4, 4.0, 4.8, 5.8 **Clutch** single plate dry disc operated by foot pedal **Brakes** double dry disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 155″ left 155″ (on concrete surface without brake) right 170″ left 170″ **Turning space diameter**(on concrete surface with brake applied) right 320″ left 320″ (on concrete surface without brake) right 350″ left 350″ **Power take-off** 542 rpm and 1007 rpm at 2200 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

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 was 158°F. Six 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 **1213.**

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, ½ of the 85% torque; maximum power, ¼ and ¾ 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.

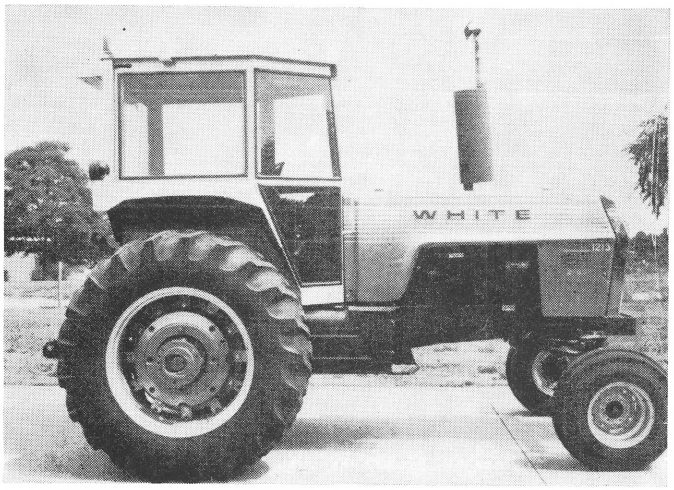
Varying Drawbar Pull and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. 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.



WHITE FIELD BOSS 2-85 DIESEL