1-1-1975

Test 1185: S.A.M.E. Panter 4WD Diesel

Nebraska Tractor Test Lab
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NEBRASKA TRACTOR TEST 1185 – SAME PANTER 4WD DIESEL

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—1036 rpm)								
80.02	2200	5.399	0.466	14.82	Air-cooled	63	75	29.020
Standard Power Take-off Speed (1000 rpm)—One Hour								
79.10	2125	5.347	0.467	14.79	Air-cooled	63	77	29.045
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
71.48	2311	4.549	0.440	15.71	Air-cooled	63	78	.....
0.00	2654	1.658	.....	.....	Air-cooled	63	77	.....
38.07	2464	3.004	0.545	12.67	Air-cooled	63	77	.....
78.46	2200	5.348	0.471	14.67	Air-cooled	65	77	.....
20.02	2589	2.374	0.820	8.43	Air-cooled	65	77	.....
56.09	2419	3.798	0.468	14.77	Air-cooled	65	77	.....
Av 44.02	**2439**	**3.455**	**0.542**	**12.74**	**Air-cooled**	**64**	**77**	**29.063**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Fuel Consumption Slip of drivers %	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											
Maximum Available Power—Two Hours 9th (1 V) Gear											
65.72	4286	5.75	2199	4.18	5.300	0.557	12.40	Air-cl.	67	68	28.985
75% of Pull at Maximum Power—Ten Hours 9th (1 V) Gear											
53.05	3210	6.20	2341	3.08	4.312	0.562	12.30	Air-cl.	61	67	29.044
50% of Pull at Maximum Power—Two Hours 9th (1 V) Gear											
36.90	2106	6.57	2460	2.18	3.690	0.691	10.00	Air-cl.	64	66	29.075
50% of Pull at Reduced Engine Speed—Two Hours 10th (2 V) Gear											
36.85	2107	6.56	1762	2.10	2.840	0.533	12.98	Air-cl.	59	68	29.045
MAXIMUM POWER WITH BALLAST											
62.45	10389	2.25	2217	14.73	6th Gear (2 N)			Air-cooled	56	61	29.050
65.05	7380	3.31	2199	8.09	7th Gear (3 N)			Air-cooled	66	69	29.020
65.25	5394	4.54	2200	5.47	8th Gear (4 N)			Air-cooled	66	69	29.020
66.67	4345	5.75	2201	4.33	9th Gear (1 V)			Air-cooled	66	69	29.010
64.34	2966	8.13	2200	2.71	10th Gear (2 V)			Air-cooled	66	69	29.000

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—9th Gear (1 V)

Pounds Pull	4345	4459	4684	4644	4227	4281
Horsepower	66.67	61.25	57.14	49.51	38.80	32.79
Crankshaft Speed rpm	2201	1973	1756	1534	1314	1098
Miles Per Hour	5.75	5.15	4.57	4.00	3.44	2.87
Slip of Drivers %	4.33	4.33	4.62	4.47	4.33	4.33

TRACTOR SOUND LEVEL (with cab)	dB(A)
Maximum Available Power 2 Hours	96.5
75% of Pull at Max. Power 10 Hours	96.0
50% of Pull at Max. Power 2 Hours	97.0
50% of Pull at Reduced Engine Speed 2 Hours	92.5
Bystander in 12th gear (4 V)	88.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 18.4-34; 8; 18	Two 18.4-34; 8; 18
Ballast	—Liquid	834 lb. each	None
	Cast Iron	None	None
Front Tires	—No., size, ply & psi	Two 13.6-24; 8; 18	Two 13.6-24; 8; 18
Ballast	—Liquid	317 lb. each	None
	Cast Iron (front end)	470 lbs. total	None
Height of drawbar		20.5 inches	20.5 inches
Static weight with operator	—rear	7250 lb.	5582 lb.
	front	4750 lb.	3646 lb.
	total	12000 lb.	9228 lb.

Department of Agricultural Engineering

Dates of Test: August 28 to September 9, 1975

Manufacturer: S.A.M.E. S.p.A. Treviglio, Italy

FUEL, OIL AND TIME **Fuel** Diesel **Cetane No.** 51.7 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.830 **Weight per gallon** 6.911 lb **Oil SAE** 30 **API service classification** SB/SE-CA/CC **To motor** 3.060 gal **Drained from motor** 2.196 gal **Transmission and final drive lubricant SAE** 80 **Total time engine was operated** 45.5 hours

ENGINE **Make** S.A.M.E. S.p.A. **Type** 5 cylinder air-cooled **Serial No.** 1064 **Crankshaft Mounted** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.86″ x 4.72″ **Compression ratio** 17 to 1 **Displacement** 276 cu. in. **Lubrication** pressure **Cranking system** electric 12 V **Air cleaner** dry paper element with centrifugal pre-cleaner and dust evacuator **Oil filter** paper cartridge **Oil cooler** radiator for crankcase oil **Fuel filter** one cartridge **Muffler** vertical **Cooling medium temperature control** air-cooled

CHASSIS **Type** four-wheel drive **Serial No.** 1064 **Tread width** rear 63″ to 86.6″ front 63″ to 86.6″ **Wheel base** 98.4″ **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 40″ Vertical distance above roadway 33″ 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 shift **Advertised speeds mph** first 0.5 second 0.7 third 1.0 fourth 1.4 fifth 1.7 sixth 2.4 seventh 3.3 eighth 4.5 ninth 5.5 tenth 7.6 eleventh 10.4 twelfth 14.3 reverse 0.9, 2.8, 9.0 **Clutch** single plate dry disc operated by foot pedal **Brakes** wet discs operated by hand lever and two pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 195″ left 193″ (on concrete surface without brake) right 224″ left 224″ **Turning space diameter** (on concrete surface with brake applied) right 402″ left 398″ (on concrete surface without brake) right 461″ left 461″ **Power take-off** 540 rpm at 2000 engine rpm and 1000 rpm at 2125 engine rpm.

REPAIRS AND ADJUSTMENTS: Leakage from steering mechanism and gear selector had to be corrected. Tests were continued after repair. High idle speed could not be adjusted to the specified value in the application.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Fuel temperature at injection pump return was 183°F. Five gears were chosen between 15% slip and 15 MPH (only one gear permitted over 8 MPH).

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1185.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

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Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska – Lincoln
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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 68503.**

SAME PANTER 4WD DIESEL