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6-8-1953

## Test 495: Someca DA 50

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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The Experiment Station  
University of Nebraska College of Agriculture  
W. V. Lambert, Director, Lincoln, Nebraska

Department of Agricultural Engineering  
Dates of test: June 8 to June 13, 1953.  
Manufacturer: SOMECA 47, BD. ORNANO,  
SAINT-DENIS—(SEINE) FRANCE  
Manufacturer's rating: 35 Belt Hp.

NEBRASKA TRACTOR TEST NO. 495

SOMECA DA 50

**BELT HORSEPOWER TESTS**

Hp	Crank shaft speed rpm	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercury
		Gal per hour	Hp-hr per gal	Lb per hp-hour		Cooling med	Air	
* TESTS B and C—100% MAXIMUM LOAD—TWO HOURS								
38.94	1500	2.489	15.64	0.450	0.00	192	82	28.820
TEST D—RATED LOAD—ONE HOUR								
35.26	1503	2.251	15.66	0.450	0.00	188	87	28.815
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
35.32	1505	2.250	15.70	0.448	...	189	89	.....
0.76	1557	0.712	1.07	6.592	...	159	86	.....
18.06	1532	1.406	12.84	0.548	...	166	87	.....
37.26	1452	2.382	15.64	0.450	...	195	88	.....
9.12	1545	1.023	8.91	0.789	...	164	89	.....
26.80	1520	1.803	14.86	0.474	...	179	90	.....
21.22	1518	1.596	13.30	0.529	0.00	175	88	28.815

**TORQUE (at dynamometer)**

RPM	1504	1404	1298	1203	1103	996	895	799	699	606
Lb.-ft.	321.1	324.1	325.5	324.6	327.3	325.7	325.3	319.6	311.5	300.8

**DRAWBAR HORSEPOWER TESTS**

Hp	Draw bar pull lb	Speed miles per hr	Crank shaft speed rpm	Slip of drive wheels %	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercur
					Gal per hour	Hp-hr per gal	Lb per hp-hr		Cool- ing med	Air	
TESTS F and G—100% MAXIMUM LOAD											
23.31	4707	1.86	1499	16.77	.....	Not Recorded	.....	175	89	28.990	
31.69	4715	2.52	1502	16.00	.....	Not Recorded	.....	183	89	28.990	
33.33	3541	3.53	1502	10.70	.....	Not Recorded	.....	185	83	28.980	
33.37	1962	6.38	1499	5.12	.....	Not Recorded	.....	184	83	28.980	
30.96	936	12.41	1499	2.53	.....	Not Recorded	.....	180	86	28.990	
TEST H—RATED LOAD—TEN HOURS—3rd GEAR											
26.55	2751	3.62	1500	8.25	1.991	13.34	0.528	0.00	188	96	28.968
TEST J—OPERATING MAXIMUM LOAD—3rd GEAR											
28.59	3171	3.38	1503	15.75	.....	Not Recorded	.....	176	80	29.050	

**TIRES, WHEELS and WEIGHT**

	Tests F, G, & H	Test J
<b>Rear wheels</b>		
Type	Pressed steel	Pressed steel
Liquid ballast	400 lb each	None
Added cast iron	900 lb each	None
<b>Rear tires</b>		
No. and size	Two 12-75-24	Two 12-75-24
Ply	6	6
Air pressure	14 lb	12 lb
<b>Front wheels</b>		
Type	Pressed steel	Pressed steel
Liquid ballast	37 lb each	None
Added cast iron	138 lb each	None
<b>Front tires</b>		
No. and size	Two 6.00-19	Two 6.00-19
Ply	4	4
Air pressure	28 lb	28 lb
Height of drawbar	22½ inches	23 inches
<b>Static weight</b>		
Rear end	5670 lb	3070 lb
Front end	2117 lb	1766 lb
<b>Total weight as tested with operator</b>	7962 lb	5011 lb

**FUEL, OIL and TIME** Diesel Fuel cetane No ASTM 50 (rating taken from oil company's typical inspection data); weight per gallon 7.040 lb Oil SAE 40; to motor 2.145 gal; drained from motor 2.026 gal Total time motor was operated 39½ hours.

**CHASSIS TYPE** Standard Serial No 10045 Tread width rear 52.8" and 76" front 51.2" Wheel Base 75" Hydraulic control system no Advertised speeds mph first 2.34 second 3.12 third 4.08 fourth 7.06 fifth 13.3 reverse 1.85 Belt pulley diam 11.81" face 7" rpm 750 Belt speed 2325 fpm Clutch operated by foot pedal Seat pressed steel Brakes internal expanding shoe operated by two foot pedals Equalized by master pedal Power take-off standard type.

**ENGINE** Make O. M. Milano (Italy) Type 4 cylinder vertical Diesel Serial No 100,088 Crankshaft mounted lengthwise Head I Lubrication pressure Bore and Stroke 3.937" x 4.724" Rated rpm 1500 Compression ratio 16 to 1 Displacement 230 cu in. Port Diameter Valves inlet 1.217" exhaust 1.217" Governor variable speed centrifugal Starting System two 6 volt batteries Air Cleaner oil washed wire screen Muffler was used Oil Filter one auto cleaner and one cotton replaceable cartridge Fuel Filter one screen filter and one replaceable filter element Cooling medium temperature control thermostat and curtain.

**REPAIRS AND ADJUSTMENTS** No repairs or adjustments.

**REMARKS** All test results were determined from observed data and without allowances, additions or deductions. Tests B and F were made with fuel pump set to develop approximately 41 corr. maximum horsepower and data from these tests were used in determining the horsepower to be developed in tests D and H, respectively. Tests C, D, E, G, H, & J were made with the same setting.

**HORSEPOWER SUMMARY**

	Draw- bar	Belt
1. Sea level (calculated) maximum horsepower (based on 60°F and 29.92" HG)	35.16	41.28
2. Observed maximum horsepower (tests F & B)	33.33	38.94
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly ASAE and SAE ratings)	26.37	35.09

We, the undersigned, certify that this is a true and correct report of official tractor test No. 495.

L. F. LARSEN  
Engineer-in-Charge

C. W. SMITH  
L. W. HURLBUT  
F. D. YUNG  
Board of Tractor  
Test Engineers

## EXPLANATION OF TEST REPORT

**TEST A:** The manufacturer's representative operates the tractor for a minimum of 12 hours using light to heavy drawbar loads in each gear.

This serves as a period for limber up, general observation and adjustments. Adjustments that are permissible include valve tappet clearance, breaker point gap, spark plug gaps, clutch and others of a similar nature. No new parts or accessories can be installed without having mention made of it in the report.

No data are recorded during this preliminary run except the time that the engine is operated.

### BELT HORSEPOWER TESTS

**TEST B:** The throttle valve is held wide open and the belt load on the dynamometer is adjusted so that the engine is at the rated speed recommended by the manufacturer. Carburetor, ignition timing and manifold adjustments are all set for maximum engine power.

This test is designed to determine maximum belt horsepower of the tractor at rated speed and to measure fuel consumption at the maximum power on the belt.

**TEST C:** For tractors with carburetors the best fuel economy does not always occur when the engine develops maximum power at rated speed. Test C is intended to allow the manufacturer's representative to select a more economical fuel setting even though there is a slight loss of power. *This more practical carburetor setting is used in all later tests except test F.* The throttle valve is held wide open and load adjusted to give rated rpm. Tests B and C are the same for diesel tractors, which have an altogether different fuel system.

**TEST D:** The throttle control lever is set so that the governor will maintain rated engine speed when rated load is applied. Rated load is 85% of 100% maximum, as obtained in test B, corrected to standard conditions.

This rating is somewhat less than the maximum belt horsepower in order that the operator may have a certain amount of reserve.

### TEST E:

Varying load serves to show the range of engine speeds when the engine is controlled by the governor during the following varied loads of 20 minutes each: rated load, no load,  $\frac{1}{2}$  rated load, maximum load at wide open throttle valve,  $\frac{1}{4}$  and  $\frac{3}{4}$  rated load.

The average result of this test shows the average power and fuel consumption. Since the average tractor is subjected to varying loads, these data serve well in predicting fuel consumption and efficiency of a tractor in general use.

Torque, lb-ft at dynamometer, is obtained with wide open throttle and sufficient load is applied to give several readings.

### DRAWBAR HORSEPOWER TESTS

In all drawbar tests the pull exerted by the tractor is transmitted by a hydraulic pressure cylinder to a recording instrument in the test car. All tests are made on the same dirt test course which is maintained by grading, sprinkling and rolling so that it remains very nearly the same throughout the season.

The same tires, wheels and weights are used for all tests except J and K.

**TEST F:** A drawbar test, the results of which are used to determine the rated drawbar horsepower in test H. The carburetor is set to develop maximum power as in test B. The rated gear recommended by manufacturer as plow gear is used in this test. The drawbar load is adjusted to give rated engine speed.

**TEST G:** Maximum drawbar horsepower is determined in each gear when the carburetor is set for fuel economy as in test C. The throttle valve is held wide open and the load is applied so that the engine runs at rated engine speed.

When operating in low gear it is not uncommon for the tractor to develop less drawbar horsepower than in rated gear because of excessive wheel slippage. When excessive wheel slippage occurs the load is reduced until slippage approaches 16%. When the load is reduced it is necessary to operate the tractor engine at part throttle and control engine speed by governor action.

**TEST H:** Intended to test the ability of the tractor to run continuously for 10 hours at rated drawbar horsepower and to determine the fuel consumption during that time. Rated drawbar horsepower is 75% of 100% maximum drawbar horsepower (Test F), corrected to standard conditions.

When operating at rated load the throttle control lever is set to maintain rated engine speed. This rating is less than maximum drawbar horsepower in order that the operator may have a certain amount of reserve.

**TEST J:** The tractor is operated in rated gear with all added weight removed. This test shows the effect of the removal of added weight on the performance of the tractor when compared with test G.

Removal of wheel weights generally increases wheel slippage and decreases drawbar horsepower.

**TEST K:** Similar to test J except that the smallest tires and lightest wheels offered by the manufacturer are used.

