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January 1972

## Test 1106: Satoh S650G Gasoline (Also Bison Gasoline)

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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# NEBRASKA TRACTOR TEST 1106 – SATOH S650G GASOLINE ALSO BISON GAS

## 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 (PTO Speed—1092 rpm)</b>								
22.03	2798	2.193	0.607	10.05	187	69	75	28.913
<b>Standard Power Take-off Speed (540 rpm)—One Hour</b>								
21.48	2800	2.186	0.621	9.83	189	69	75	28.990
<b>Standard Power Take-off Speed (1000 rpm)—One Hour</b>								
20.37	2564	2.055	0.616	9.91	189	69	75	28.935
<b>VARYING POWER AND FUEL CONSUMPTION—Two Hours</b>								
20.17	3012	1.888	0.571	10.68	187	69	75	.....
0.00	3165	0.737	.....	.....	182	69	74	.....
10.27	3076	1.308	0.777	7.85	188	69	75	.....
22.04	2800	2.198	0.608	10.03	190	69	75	.....
5.24	3126	0.983	1.145	5.33	184	68	74	.....
15.27	3041	1.598	0.639	9.56	189	68	75	.....
Av 12.17	3037	1.452	0.728	8.38	187	69	75	28.970

## DRAWBAR PERFORMANCE

Hp	Draw-bar 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	

### VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST

<b>Maximum Available Power—Two Hours—5th Gear (L3)</b>											
18.16	1726	3.95	2794	8.73	2.124	0.713	8.55	168	63	75	29.100
<b>75% of Pull at Maximum Power—Ten Hours—5th Gear (L3)</b>											
15.87	1345	4.42	3054	6.37	1.757	0.675	9.03	161	63	67	29.098
<b>50% of Pull at Maximum Power—Two Hours—5th Gear (L3)</b>											
11.62	968	4.50	3045	4.46	1.474	0.774	7.88	180	71	81	28.950

### MAXIMUM POWER WITH BALLAST

13.67	2794	1.84	2993	14.64	3rd Gear (H1)	.....	185	71	75	28.900
17.62	2423	2.73	2799	12.83	4th Gear (H2)	.....	155	63	75	29.120
18.78	1780	3.96	2799	8.60	5th Gear (L3)	.....	157	63	74	29.120
17.34	613	10.60	2805	2.81	6th Gear (H3)	.....	165	63	74	29.120

### VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 5th Gear (L3)

Pounds Pull	1780	1796	1797	1819	1762	1645
Horsepower	18.78	16.96	15.09	13.46	11.30	8.67
Crankshaft Speed rpm	2799	2507	2234	1969	1701	1391
Miles Per Hour	3.96	3.54	3.15	2.77	2.40	1.98
Slip off Drivers %	8.60	8.73	8.82	9.00	8.56	8.11

### TRACTOR SOUND LEVEL WITHOUT CAB dB(A)

Maximum Available Power 2 Hours	96.5
75% of Pull at Max. Power 10 Hours	95.5
50% of Pull at Max. Power 2 Hours	95.0
Bystander 6 <sup>th</sup> GEAR (H3)	83.0

### TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 11.2-24; 4; 16	Two 11.2-24; 4; 16
	Ballast	172 lb each	None
	Cast Iron	403 lb each	None
Front Tires	—No., size, ply & psi	Two 5.00-15; 4; 28	Two 5.00-15; 4; 28
	Ballast	None	None
	Cast Iron	125 lb each	None
Height of drawbar		16 inches	16½ inches
Static weight with operator—rear		2710 lb	1560 lb
	front	930 lb	680 lb
	total	3640 lb	2240 lb

Department of Agricultural Engineering  
Dates of Test: September 4 to 12, 1972

Manufacturer: SATOH AGRICULTURAL MACHINE COMPANY, LTD., HIGASHIIZUMO-CHO YATSUKA GUN SHIMANE PREF. JAPAN

**FUEL, OIL AND TIME** Fuel lead free gasoline Octane No. Motor 82.7 Research 91.6 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° 0.7330 Weight per gallon 6.102 lb Oil SAE 10W-30 API Service classification SE-CC-MS To motor 0.728 gal Drained from motor 0.699 gal Transmission and final drive lubricant SAE 90 Total time engine was operated 46 hours

**ENGINE** Make Mazda gasoline Type 4 cylinder vertical Serial No. S203112 Crankshaft Mounted lengthwise Rated rpm 2800 Bore and stroke 2.677" x 2.677" Compression ratio 8.6 to 1 Displacement 60.2 cu. in. Carburetor size 1" Ignition system battery Cranking system 12 volt electric Lubrication pressure Air cleaner oil bath with wire mesh Oil filter replaceable pleated paper cartridge Fuel filter replaceable pleated paper cartridge Muffler was used Cooling medium temperature control thermostat

**CHASSIS** Type standard Serial No. 200700 Tread width rear 40.0" to 51.7" front 40.9" to 52.8" Wheelbase 60.4" 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 or rear wheels 19.1" Vertical distance above roadway 25.8" 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 0.9 second 1.3 third 2.1 fourth 3.3 fifth 4.6 sixth 11.6 reverse 1.8 and 4.6 Clutch single plate dry disc Brakes internal expanding shoe operated by two foot pedals that can be locked together Steering mechanical Turning radius (on concrete surface with brake applied) right 95.7" left 94.1" (on concrete surface without brake) right 103.2" left 101.6" Turning space diameter on concrete surface with brake applied) right 200.0" left 196.8" (on concrete surface without brake) right 215.0" left 211.8" Belt pulley 540 rpm at 2800 engine rpm diam 8" face 4" Belt speed 1130 fpm Power take-off 540 rpm at 2800 engine rpm or 1000 rpm at 2564 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. First, and second gears were not run as it was necessary to limit the pull in third gear because of the stability formula. Available gear ratios did not permit running 50% of pull at reduced speed

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1106.

L. F. LARSEN

Engineer-In-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

D. E. LANE

Board of Tractor Test Engineers

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