

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

5-10-1980

Test 1347: Satoh Mitsubishi Stallion S750 DD and S750 D 9-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Nebraska Tractor Test Lab, "Test 1347: Satoh Mitsubishi Stallion S750 DD and S750 D 9-Speed" (1980). *Nebraska Tractor Tests*. 1666.

<https://digitalcommons.unl.edu/tractormuseumlit/1666>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA TRACTOR TEST 1347 — SATOH MITSUBISHI STALLION S750 DD ALSO S750 D 9 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption			Temperature °F (°C)			Barometer inch Hg (kPa)
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—652 rpm)								
* 33.45 (24.95)	2500	2.851 (10.793)	0.602 (0.366)	11.73 (2.311)	216 (102.5)	56 (13.6)	75 (23.8)	28.913 (97.636)
Standard Power Take-Off Speed (540 rpm)—One Hour								
28.11 (20.96)	2070	2.358 (8.925)	0.592 (0.360)	11.92 (2.349)	218 (103.4)	56 (13.5)	75 (23.9)	28.930 (97.692)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
29.39 (21.91)	2584	2.116 (8.008)	0.508 (0.309)	13.89 (2.736)	204 (95.3)	56 (13.6)	75 (23.9)	..... .....
0.00 (0.00)	2686	0.828 (3.136)	..... .....	..... .....	174 (79.2)	56 (13.3)	75 (23.9)	..... .....
15.00 (11.18)	2638	1.342 (5.082)	0.632 (0.384)	11.17 (2.201)	182 (83.1)	56 (13.3)	76 (24.4)	..... .....
33.20 (24.76)	2501	2.897 (10.967)	0.616 (0.375)	11.46 (2.258)	211 (99.4)	55 (12.8)	75 (23.9)	..... .....
7.57 (5.64)	2662	0.998 (3.779)	0.931 (0.566)	7.58 (1.494)	179 (81.7)	55 (12.8)	74 (23.6)	..... .....
22.27 (16.61)	2611	1.682 (6.368)	0.533 (0.325)	13.24 (2.608)	188 (86.4)	55 (12.8)	76 (24.2)	..... .....
Av 17.90 Av (13.35)	2614	1.644 (6.223)	0.648 (0.394)	10.89 (2.145)	190 (87.5)	56 (13.1)	75 (24.0)	28.923 (97.670)

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 6th (M-3) Gear											
26.71 (19.92)	2029 (9.03)	4.94 (7.94)	2500	6.00	2.708 (10.251)	0.716 (0.436)	9.86 (1.943)	210 (98.9)	56 (13.3)	73 (22.8)	28.950 (97.760)
75% of Pull at Maximum Power—Ten Hours 6th (M-3) Gear											
22.48 (16.77)	1626 (7.23)	5.18 (8.34)	2608	5.30	2.011 (7.612)	0.632 (0.384)	11.18 (2.203)	180 (82.2)	51 (10.6)	52 (11.2)	28.841 (97.392)
50% of Pull at Maximum Power—Two Hours 6th (M-3) Gear											
15.43 (11.51)	1087 (4.83)	5.33 (8.57)	2638	3.88	1.611 (6.097)	0.737 (0.448)	9.58 (1.888)	178 (80.8)	52 (11.1)	53 (11.7)	28.760 (97.118)
50% of Pull at Reduced Engine Speed—Two Hours 8th (H-2) Gear											
15.51 (11.57)	1089 (4.84)	5.34 (8.60)	1700	3.71	1.310 (4.958)	0.596 (0.363)	11.84 (2.333)	176 (80.0)	54 (11.9)	54 (12.2)	28.770 (97.152)
MAXIMUM POWER IN SELECTED GEARS											
24.82 (18.51)	4295 (19.11)	2.17 (3.49)	2577	14.89	4th (M-1) Gear			182 (83.3)	54 (12.2)	57 (13.9)	28.790 (97.220)
27.23 (20.30)	3600 (16.02)	2.84 (4.56)	2502	12.03	5th (M-2) Gear			204 (95.6)	56 (13.3)	70 (21.1)	28.940 (97.726)
28.57 (21.30)	2168 (9.65)	4.94 (7.95)	2502	5.86	6th (M-3) Gear			196 (91.1)	54 (12.2)	64 (17.8)	28.950 (97.760)
28.99 (21.61)	1832 (8.15)	5.93 (9.55)	2500	5.20	7th (H-1) Gear			203 (95.0)	55 (12.8)	70 (21.1)	28.930 (97.692)
28.36 (21.15)	1355 (6.03)	7.85 (12.63)	2500	3.85	8th (H-2) Gear			204 (95.3)	57 (13.9)	72 (22.2)	28.930 (97.692)

Department of Agricultural Engineering

Dates of Test: May 10—19, 1980

Manufacturer: MITSUBISHI AGRICULTURAL MACHINERY CO., LTD, Higashi Izumo-cho Yatsuka-gun Shimane Pref. Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 47.9 (rating taken from oil company's inspection data) Specific gravity converted to 60°/60° (15°/15°) 0.8482 Fuel weight 7.062 lbs/gal (0.846 kg/l) Oil SAE 30 API service classification SB/SE-CA/CD To motor 1.474 gal (5.579 l) Drained from motor 1.332 gal (5.042 l) Transmission and final drive lubricant SAE 80 Total time engine was operated 48.0 hours.

ENGINE Make ISUZU Dsl **Type** three cylinder vertical **Serial No.** 530033 **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.386" × 4.016" (86 mm × 102 mm) **Compression ratio** 20.0 to 1 **Displacement** 108.4 cu in (1777 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper cartridge and one mesh screen **Muffler** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type front wheel assist **Serial No.** S-750DD-00042 **Tread width** rear 52" (1320 mm) to 71.7" (1820 mm) front 50.2" (1275 mm) **Wheel base** 73.6" (1870 mm) **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 28.1" (714 mm) Vertical distance above roadway 33.1" (841 mm) Horizontal distance from center of rear wheel tread 0" (0 mm) to the right/left **Hydraulic control system** direct engine drive **Transmission** Selective gear fixed ratio **Advertised speeds mph (km/h)** first 0.9 (1.5) second 1.2 (1.9) third 1.9 (3.1) fourth 2.5 (4.0) fifth 3.2 (5.2) sixth 5.2 (8.4) seventh 6.2 (10.0) eighth 8.1 (13.1) ninth 15.9 (25.6) reverse 1.5 (2.4), 4.0 (6.4) 10.1 (16.2) **Clutch** dual dry disc operated by foot pedal **Brakes** expanding shoe operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 110.2" (2.80 m) left 110.2" (2.80 m) (on concrete surface without brake) right 121.2" (3.08 m) left 121.2" (3.08 m) **Turning space diameter** (on concrete surface with brake applied) right 228.2" (5.80 m) left 228.2" (5.80 m) (on concrete surface without brake) right 250" (6.35 m) left 250" (6.35 m) **Power take-off** 540 rpm at 2070 engine rpm.

LUGGING ABILITY IN 6th (M-3) GEAR

Crankshaft Speed rpm	2502	2252	1994	1754	1485	1240
Pull—lbs (kN)	2168 (9.65)	2237 (9.95)	2251 (10.01)	2271 (10.10)	2178 (9.69)	2067 (9.19)
Increase in Pull %	0	3	4	5	0	-5
Power—Hp (kW)	28.57 (21.30)	26.48 (19.74)	23.56 (17.57)	20.89 (15.57)	17.01 (12.69)	13.52 (10.08)
Speed—Mph (km/h)	4.94 (7.95)	4.44 (7.14)	3.93 (6.32)	3.45 (5.55)	2.93 (4.72)	2.45 (3.95)
Slip %	5.86	6.13	6.24	6.35	6.02	5.59

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	99.5	99.0
75% of Pull at Maximum Power—Ten Hours	—	97.0
50% of Pull at Maximum Power—Two Hours	—	98.5
50% of Pull at Reduced Engine Speed—Two Hours	—	92.5
Bystander in 9th (H-3) gear	—	84.5

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool- ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 6th (M-3) Gear											
26.14 (19.49)	1944 (8.65)	5.04 (8.11)	2500	4.74	2.726 (10.318)	0.737 (0.448)	9.59 (1.889)	213 (100.3)	57 (13.6)	75 (23.6)	28.885 (97.541)

MAXIMUM POWER IN SELECTED GEARS

26.77 (19.97)	4655 (20.71)	2.16 (3.47)	2543	14.94	4th (M-1) Gear		183 (83.9)	54 (12.2)	57 (13.9)	28.790 (97.220)
28.27 (21.08)	2107 (9.37)	5.03 (8.10)	2499	5.05	6th (M-3) Gear		199 (92.8)	55 (12.8)	68 (20.0)	28.950 (97.760)

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 13.6-28; 4; 14 (95)	Two 13.6-28; 4; 14 (95)
Ballast	—Liquid (each)	425 lb (193 kg)	None
	—Cast Iron (each)	385 lb (174 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 7-16; 4; 26 (180)	Two 7-16; 4; 26 (180)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	None	None
Height of Drawbar		17.5 in (445 mm)	17.5 in (445 mm)
Static Weight with Operator—Rear		4050 lb (1837 kg)	2430 lb (1103 kg)
	—Front	1500 lb (680 kg)	1500 lb (680 kg)
	—Total	5550 lb (2517 kg)	3930 lb (1783 kg)



Satoh Mitsubishi Stallion

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
Roy G. Arnold, Director

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 168°F (75.6°C). Five gears were chosen between 15% slip and 10 mph (16.1 km/h). The front wheel final drives leaked oil slightly during the tests.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1347.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers