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Test 438: Minneapolis-Moline Z

Nebraska Tractor Test Laboratory Submitted by Larsen Museum
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BELT HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer in Hg
		Gal per hour	Hp-hr per gal	Lb per hp-hour		Cooling med	Air	
TEST B—100% MAXIMUM LOAD—TWO HOURS								
36.20	1500	3.517	10.29	0.591	0.00	177	60	28.900
TEST C—OPERATING MAXIMUM LOAD—ONE HOUR								
34.77	1500	3.237	10.74	0.566	0.00	180	65	28.900
TEST D—RATED LOAD—ONE HOUR								
31.85	1500	3.134	10.16	0.598	0.00	180	68	28.900
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
31.85	1500	3.129	10.18	0.597	...	180	68
1.20	1616	1.481	0.81	7.500	...	158	67
16.67	1563	2.364	7.05	0.862	...	167	68
34.73	1454	3.292	10.55	0.576	...	185	70
8.48	1592	1.890	4.49	1.355	...	162	68
24.42	1534	2.764	8.84	0.688	...	174	69
19.56	1543	2.486	7.87	0.773	0.00	171	68	28.900

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 in Hg
					Gal per hour	Hp-hr per gal	Lb per hp-hr		Cooling med	Air	
TEST F—100% MAXIMUM LOAD—3rd GEAR											
32.07	2780	4.33	1505	7.04	Not Recorded				175	72	29.090
TEST G—OPERATING MAXIMUM LOAD											
19.47	3498	2.09	1509	15.37	Not Recorded				170	76	29.085
28.85	3556	3.04	1503	15.79	" "				176	74	29.080
31.52	2719	4.35	1501	6.34	" "				171	56	29.080
31.50	1946	6.07	1503	4.06	" "				169	57	29.080
26.46	763	13.00	1501	1.45	" "				172	63	29.085
TEST H—RATED LOAD—TEN HOURS—3rd GEAR											
25.18	2147	4.40	1502	5.27	2.946	8.55	0.711	0.00	173	67	29.112
TEST J—OPERATING MAXIMUM LOAD—3rd GEAR											
30.30	2739	4.15	1501	11.22	Not Recorded				173	64	28.780

FUEL, OIL and TIME Gasoline octane No ASTM 76 Research 82 (rating taken from oil company's typical inspection data); weight per gal 6.079 lb Oil SAE 30; to motor 1.493 gal; drained from motor 1.289 gal Total time motor was operated 37 hours.

CHASSIS Type tricycle Serial No 0064900842 Tread width rear 54 to 88" front 7 3/4" and 12 1/2" Wheel Base 83" Hydraulic control system direct engine drive Advertised speeds mph first 2.4 second 3.6 third 4.6 fourth 6.3 fifth 13.1 reverse 2.2 Belt pulley diam 15 1/2" face 7" rpm 786 Belt speed 3100 fpm Clutch single plate over center hand operated Seat swinging seat with air cushion and padded back rest Brakes internal expanding shoe operated by foot pedal for each brake with one master brake pedal Equalized by linkage adjustment Power take-off standard type.

ENGINE Make Minneapolis-Moline Type 4 cylinder vertical Serial No 0184900956 Crankshaft mounted lengthwise Head horizontal valve Lubrication pressure Bore and Stroke 3 3/8 x 5" Rated rpm 1500 Compression ratio 6.19-1 Displacement 206 cu in Port Diameter Valves inlet 1.250 exhaust 1.250 Governor own Carburetor Size 1" Ignition System 6 volt battery Air Cleaner oil washed wire screen Muffler used Oil Filter replaceable cartridge Cooling medium temperature control thermostat.

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 carburetor set for 100% maximum belt 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 and J were made with an operating setting of the carburetor (selected by the manufacturer) of 96.5% of maximum belt horsepower.

TIRES, WHEELS and WEIGHT

	Tests F, G & H	Test J	Test K
Rear wheels Type	Pressed steel	Pressed steel	
Liquid ballast	430 lb each	None	
Added cast iron	330 lb each	None	
Rear tires No. and size	Two 11-38	Two 11-38	
Ply	4	4	
Air pressure	12 lb	12 lb	
Front wheels Type	Pressed steel	Pressed steel	
Liquid ballast	None	None	
Added cast iron	58 lb each	None	
Front tires No. and size	Two 5.50-16	Two 5.50-16	
Ply	4	4	
Air pressure	28 lb	28 lb	
Height of drawbar	14 1/2 inches	15 1/2 inches	
Static weight Rear end	4344 lb	2825 lb	
Front end	1396 lb	1280 lb	
Total weight as tested with operator	5925 lb	4290 lb	

No smaller tires suggested by manufacturer.

HORSEPOWER SUMMARY

	Draw-bar	Belt
1. Sea level (calculated) maximum horsepower (based on 60° F. and 29.92" Hg)	33.36	37.48
2. Observed maximum horsepower tests F and B)	32.07	36.20
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)	25.02	31.86

We, the undersigned, certify that this is a true and correct report of official tractor test No. 438.

L. F. Larsen
Engineer in Charge

C. W. Smith
F. D. Yung
L. W. Hurlbut
Board of Tractor
Test Engineers