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January 1971

## Test 1070: Minneapolis-Moline A4T-1600 Diesel (Also Oliver 1655 Diesel) 10-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1070 – MINNEAPOLIS-MOLINE A4T-1600 DIESEL (ALSO OLIVER 2655 DIESEL) 10 SPEED

## POWER TAKE-OFF PERFORMANCE

Hp	Crank- shaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>								
<b>Rated Engine Speed—Two Hours (PTO Speed—1216 rpm)</b>								
143.27	2200	10.087	0.489	14.20	206	58	75	29.107
<b>Standard Power Take-off Speed (1000 rpm)—One Hour</b>								
125.38	1809	8.866	0.491	14.14	206	58	75	29.160
<b>VARYING POWER AND FUEL CONSUMPTION—Two Hours</b>								
125.20	2266	8.866	0.492	14.12	197	58	75	.....
0.00	2344	3.112	.....	.....	195	57	73	.....
63.85	2310	5.650	0.615	11.30	201	58	75	.....
141.78	2200	9.924	<b>0.486</b>	<b>14.29</b>	202	59	76	.....
32.18	2327	4.312	0.931	7.46	196	57	73	.....
94.73	2286	7.045	0.517	13.45	201	58	76	.....
<b>Av 76.29</b>	<b>2289</b>	<b>6.485</b>	<b>0.591</b>	<b>11.76</b>	<b>199</b>	<b>58</b>	<b>75</b>	<b>29.160</b>

## DRAWBAR PERFORMANCE

Hp	Draw- bar pull lbs	Speed miles per hr	Crank- shaft speed rpm	Slip of drivers %	Fuel Consumption		Hp-hr per gal	Temp Cool- ing med	Degrees F Air wet bulb	Air dry bulb	Barometer inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITHOUT BALLAST											
Maximum Available Power—Two Hours—4th Gear (3rd Low)											
123.32	10034	4.61	2197	4.81	9.820	0.553	12.56	198	61	74	28.890
75% of Pull at Maximum Power—Two Hours—4th Gear (3rd Low)											
100.62	7873	4.79	2255	3.55	8.219	0.568	12.24	197	62	72	28.873
50% of Pull at Maximum Power—Two Hours—4th Gear (3rd Low)											
68.12	5158	4.95	2300	2.26	6.312	0.644	10.79	194	69	80	28.667
50% of Pull at Reduced Engine Speed—Two Hours—6th Gear (2nd Hi)											
68.17	5187	4.93	1586	2.30	5.162	0.526	13.21	196	68	86	29.000
MAXIMUM POWER WITHOUT BALLAST											
101.60	18236	2.09	2273	14.93	1st Gear (1 Low) ...			198	69	78	28.670
125.29	13992	3.36	2202	7.72	2nd Gear (2 Low) ...			196	55	68	29.080
127.76	10388	4.61	2202	5.01	4th Gear (3 Low) ...			198	55	68	29.080
127.84	8425	5.69	2201	3.80	5th Gear (4 Low) ...			199	57	71	29.020
129.48	7169	6.77	2199	3.14	6th Gear (2 Hi) ...			200	57	73	29.020
127.72	5243	9.13	2207	2.30	7th Gear (3 Hi) ...			200	57	72	29.020
VARYING DRAWBAR PULL AND TRAVEL SPEED WITHOUT BALLAST 4th Gear (3 Lo)											
Pounds Pull			10388	11206	11184	11646	11952	11886			
Horsepower			127.76	122.42	108.96	97.47	87.36	72.11			
Crankshaft Speed rpm			2202	1966	1759	1515	1325	1099			
Miles Per Hour			4.61	4.10	3.65	3.14	2.74	2.28			
Slip of Drivers %			5.01	5.32	5.80	5.95	6.27	6.27			
TRACTOR SOUND LEVEL WITH CAB											dB(A)
Maximum Available Power 2 Hours											87.5
75% of Pull at Max. Power 10 Hours											87.0
50% of Pull at Max. Power 2 Hours											86.0
50% of Pull at Reduced Engine Speed 2 Hours											85.0
Bystander—10th gear (5 Hi)											94.2

## TIRES, BALLAST and WEIGHT      Tested Without Ballast

<b>Rear tires</b>	—No, size, ply & psi	Two 20.8-38; 10; 18
<b>Ballast</b>	—Liquid	None
	Cast iron	None
<b>Front tires</b>	—No, size, ply & psi	Two 20.8-38; 10; 18
<b>Ballast</b>	—Liquid	None
	Cast iron	None
<b>Height of drawbar</b>		25 inches
<b>Static weight with operator—rear</b>		7070 lb
	front	12780 lb
	total	19850 lb

Department of Agricultural Engineering

Dates of Test: May 24 to June 4, 1971

**Manufacturer:** MINNEAPOLIS-MOLINE, Hopkins, Minnesota

**Fuel, Oil, and Time:** Fuel: No. 2 Diesel Cetane No 53.5 (rating taken from oil company's typical inspection data). Specific gravity converted to 60°/60° 0.8347 Weight per gallon 6.950 lb. Oil SAE 30 API service classification MS, DS To motor 4.662 gal Drained from motor 2.285 gal Transmission and final drive lubricant EP 80 gear oil Mil-L-2105A Total time engine was operated 50½ hours.

**ENGINE Make** Minneapolis-Moline Diesel **Type** 6 cylinder vertical **Serial** No 45200468 **Crankshaft Mounted** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.75" x 5.50" **Compression ratio** 15.3 to 1 **Displacement** 585 cu in **Cranking system** 12 volt electric (two 12 volt batteries) **Lubrication pressure** Air cleaner two paper elements with aspirator **Oil filter** replaceable pleated paper element **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic oil **Fuel filter** parallel flow replaceable paper cartridges **Muffler** was used **Cooling medium** temperature control thermostat.

**CHASSIS Type** four wheel drive **Serial No** 45600251 **Tread width rear** 76" to 96" **front** 76" to 96" **Wheel base** 120" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) **Horizontal distance** forward from centerline of rear wheels 77.3" **Vertical distance** above roadway 40.5" **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 2.2 second 3.4 third 4.3 fourth 4.5 fifth 5.5 sixth 6.5 seventh 8.7 eighth 10.6 ninth 12.3 tenth 23.7 reverse 3.4 and 6.5 **Clutch** single plate dry disc operated by a foot pedal **Brakes** dry dual disc hydraulically actuated by a foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 186" left 186" **Turning space diameter** (on concrete without brake) right 390" left 390" **Power take-off** 1000 rpm at 1809 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 Nebraska test procedure. Third, eighth, ninth and tenth gears were not run as test procedure requires only six gears.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1070.

**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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