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## Test 1068: Case 970 Power Shift Diesel

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1068 – CASE 970 POWER SHIFT DIESEL

## POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft 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—1070 rpm)</b>								
93.41	2000	6.207	0.461	15.05	192	60	75	29.013
<b>Standard Power Take-off Speed (1000 rpm)—One Hour</b>								
93.47	1870	6.187	0.459	15.11	194	60	75	28.970
<b>VARYING POWER AND FUEL CONSUMPTION</b>								
82.79	2084	5.601	0.469	14.78	182	60	75	.....
0.00	2162	1.938	.....	.....	180	60	75	.....
42.21	2126	3.586	0.589	11.77	187	60	75	.....
94.90	2000	6.267	0.458	15.14	186	61	72	.....
21.13	2128	2.729	0.896	7.74	183	60	75	.....
62.60	2100	4.542	0.503	13.78	183	61	75	.....
<b>Av 50.61</b>	<b>2100</b>	<b>4.110</b>	<b>0.563</b>	<b>12.31</b>	<b>183</b>	<b>60</b>	<b>75</b>	<b>28.933</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 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—7th Gear (2nd Hi)</b>											
79.85	5891	5.08	1997	5.11	6.199	0.538	12.88	188	60	76	28.890
<b>75% of Pull at Maximum Power—Ten Hours—7th Gear (2nd Hi)</b>											
65.04	4534	5.38	2088	4.07	5.259	0.560	12.37	182	52	66	28.950
<b>50% of Pull at Maximum Power—Two Hours—7th Gear (2nd Hi)</b>											
44.95	3068	5.49	2110	2.99	4.181	0.645	10.75	181	52	62	28.860
<b>50% of Pull at Reduced Engine Speed—Two Hours—8th Gear (3rd Inter)</b>											
45.04	3076	5.49	1804	2.32	3.715	0.572	12.12	185	54	62	28.870

### MAXIMUM POWER WITH BALLAST

68.30	11009	2.33	2098	14.96	2nd Gear (1st Inter.)	187	49	56	28.870
81.00	7744	3.92	1997	8.59	5th Gear (2nd Inter.)	181	48	54	28.840
81.85	6855	4.48	1999	7.60	6th Gear (3rd Low)	182	49	57	28.840
80.46	6011	5.02	1999	6.45	7th Gear (2nd High)	181	49	57	28.840
81.90	5008	6.13	2005	5.19	8th Gear (3rd Inter.)	184	49	57	28.870
73.47	2652	10.39	1998	2.95	10th Gear (4th High)	187	49	58	28.870

### MAXIMUM PULL WITHOUT BALLAST

65.99	8464	2.92	2101	14.93	4th Gear (1st High)	180	54	60	28.740
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### VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 7th Gear 2nd High)

Pounds Pull	6011	6641	7010	7050	6948	6876
Horsepower	80.46	79.05	74.11	65.05	55.37	45.46
Crankshaft Speed rpm	1999	1791	1602	1399	1206	1000
Miles Per Hour	5.02	4.46	3.96	3.46	2.99	2.48
Slip of Drivers %	6.45	7.17	7.75	7.75	7.75	7.46

### TRACTOR SOUND LEVEL

	dB(A)
Maximum Available Power 2 Hours	91.0
75% of Pull at Max. Power 10 Hours	91.0
50% of Pull at Max. Power 2 Hours	90.5
50% of Pull at Reduced Engine Speed 2 Hours	90.0
Bystander (12th gear)	89.0

### TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
<b>Rear tires</b>	Two 18.4-38; 8; 20	Two 18.4-38; 8; 16
<b>Ballast</b>	1200 lb each 420 lb each	None None
<b>Front tires</b>	Two 10.00-16; 6; 28	Two 10.00-16; 6; 28
<b>Ballast</b>	None	None
<b>Height of drawbar</b>	21 inches	21 inches
<b>Static weight with operator—rear</b>	11260 lb	8020 lb
<b>front</b>	3250 lb	3170 lb
<b>total</b>	14510 lb	11190 lb

## Department of Agricultural Engineering

Dates of Test: May 6 to May 21, 1971

Manufacturer: J. I. CASE COMPANY, RACINE, WISCONSIN

**FUEL, OIL and TIME** Fuel No. 2 Diesel Cetane No. 53.5 (rating taken from oil company's inspection data) Specific gravity converted to 60°/60° 0.8330 Weight per gallon 6.936 lb. Oil SAE 30 API service classification MS, DS To motor 2.917 gal Drained from motor 2.616 gal Transmission and final drive lubricant SAE Case TCH Oil Total time engine was operated 49 hours.

**ENGINE Make** Case Diesel **Type** 6 cylinder vertical **Serial No.** 2324117 **Crankshaft Mounted** lengthwise **Rated rpm** 2000 **Bore and stroke** 4 1/8" x 5" **Compression ratio** 16.5 to 1 **Displacement** 401 cu in **Cranking system** 12 volt electric (two 12 volt batteries) **Lubrication pressure** Air Cleaner dry type with replaceable pleated paper element **Oil filter** full flow replaceable cartridge **Oil Cooler** radiator for transmission and hydraulic oil **Fuel filter** replaceable primary and secondary filter cartridges **Muffler** was used **Cooling medium temperature Control** thermostat.

**CHASSIS Type** standard **Serial No** 8678571 **Tread width** rear 62" to 88" front 62" to 90" **Wheel base** 108" **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 31.1" Vertical distance above roadway 40.9" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial range operator controlled power shifting. **Advertised speeds mph** first 1.8 second 2.5 third 3.0 fourth 3.1 fifth 4.0 sixth 4.6 seventh 5.0 eights 6.2 ninth 7.7 tenth 10.2 eleventh 13.7 twelfth 17.0 reverse 3.1, 5.0, 7.7, 17.0 **Clutch** multiple disc wet clutches within transmission hydraulically actuated **Brakes** dry double disc hydraulically power actuated with two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 157" left 157" (on concrete surface without brake) right 184" left 184" **Turning space diameter** (on concrete surface with brake applied) right 327" left 327" (on concrete surface without brake) right 380" left 380" **Belt pulley** 1108 rpm at 1900 engine rpm diam. 10.5" face 7.25" **Belt speed** 3045 fpm **Power take-off** 1016 rpm at 1900 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 gear was not run as it was necessary to limit the pull in second gear because of excessive slippage. Third, fourth, ninth, eleventh, and twelfth gears were not run as test procedure permits a maximum of six travel speeds.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1068.

L. F. LARSEN  
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman  
W. E. SPLINTER  
D. E. LANE  
Board of Tractor Test Engineers