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## Test 1076: Case 870 Power Shift Diesel

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1076 – CASE 870 POWER SHIFT DIESEL

## 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 (1070 rpm)</b>								
77.92	2000	5.528	0.495	14.10	194	64	75	28.940
<b>Standard Power Take-off Speed (1000 rpm)—One Hour</b>								
77.11	1870	5.347	0.484	14.42	197	64	75	28.960
<b>VARYING POWER AND FUEL CONSUMPTION—TWO HOURS</b>								
68.81	2079	4.756	0.483	14.47	190	64	74	.....
0.00	2176	1.542	.....	.....	182	64	74	.....
35.13	2123	2.951	0.587	11.90	186	65	76	.....
78.21	2000	5.538	0.494	14.12	196	66	76	.....
17.74	2144	2.213	0.871	8.02	183	64	75	.....
52.26	2105	3.746	0.501	13.95	187	63	74	.....
Av. 42.03	2104	3.458	0.574	12.15	187	64	75	28.993

## DRAWBAR PERFORMANCE

Hp	Draw- bar pull lbs	Speed miles per hr	Crank- shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool- ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
<b>VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST</b>											
<b>Maximum Available Power—Two Hours—6th Gear (3 Lo)</b>											
66.89	5919	4.24	1999	6.61	5.513	0.575	12.13	192	56	72	29.050
<b>75% of Pull at Maximum Power—Ten Hours—6th Gear (3 Lo)</b>											
54.53	4508	4.54	2096	4.67	4.392	0.562	12.41	181	49	55	29.103
<b>50% of Pull at Maximum Power—Two Hours—6th Gear (3Lo)</b>											
37.94	3054	4.66	2122	3.25	3.419	0.629	11.10	184	54	58	29.060
<b>50% of Pull at Reduced Engine Speed—Two Hours—8th Gear (3 Int)</b>											
37.93	3052	4.66	1587	3.03	2.971	0.546	12.77	185	45	52	29.290

## MAXIMUM POWER WITH BALLAST

57.95	10075	2.16	2078	14.96	2nd Gear (1 Int)....	185	54	74	29.260
66.30	6679	3.72	2000	7.49	5th Gear (2 Int) ...	190	61	75	29.070
67.47	5982	4.23	1988	6.68	6th Gear (3 Lo) ...	190	59	74	29.070
66.04	5215	4.75	2000	5.72	7th Gear (2 Hi) ...	195	58	74	29.080
66.87	4327	5.79	2004	4.44	8th Gear (3 Int) ...	195	58	73	29.080
65.06	2492	9.79	1997	2.47	10th Gear (4 Lo) ...	195	58	73	29.080

## MAXIMUM PULL WITHOUT BALLAST

56.40	7722	2.74	2081	14.60	4th Gear (1 Hi)....	190	51	63	29.190
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## VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 6th Gear (3 Lo)

Pounds Pull	5982	6395	6851	7005	6984	7096	7011
Horsepower	67.47	64.55	61.10	54.99	46.57	39.31	31.41
Crankshaft Speed rpm	1988	1796	1597	1411	1199	998	806
Miles Per Hour	4.23	3.79	3.34	2.94	2.50	2.08	1.68
Slip of Drivers %	6.68	7.16	7.69	8.09	8.09	8.36	8.09

## TRACTOR SOUND LEVEL (with cab)

	dB(A)
Maximum Available Power 2 Hours	88.0
75% of Pull at Max. Power 10 Hours	88.5
50% of Pull at Max. Power 2 Hours	89.5
50% of Pull at Reduced Engine Speed 2 Hours	87.5
Bystander—12th gear (4 Hi)	86.5

<b>TIRES, BALLAST and WEIGHT</b>			<b>With Ballast</b>	<b>Without Ballast</b>
<b>Rear tires</b>	—No, size, ply & psi		Two 18.4-34; 8; 18	Two 18.4-34; 8; 16
<b>Ballast</b>	—Liquid		1055 lb each	None
	Cast iron		560 lb each	None
<b>Front tires</b>	—No, size, ply & psi		Two 10.00-16; 6; 28	Two 10.00-16; 6; 28
<b>Ballast</b>	—Liquid		None	None
	Cast iron		45 lb each	None
<b>Height of drawbar</b>			16 inches	16½ inches
<b>Static weight with operator—rear</b>			10570 lb	7340 lb
<b>front</b>			2980 lb	2890 lb
<b>total</b>			13550 lb	10230 lb

## Department of Agricultural Engineering

Dates of Test: September 13 to September 24, 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 typical inspection data) Specific gravity converted to 60°/60° 0.8387 Weight per gallon 6.983 lb Oil SAE 30 API service classification MS, DG, DM, DS To motor 2.437 gal Drained from motor 2.253 gal Transmission and final drive lubricant Case TCH oil Total time engine was operated 55 hours.

**ENGINE** Make Case Diesel Type 4 cylinder vertical Serial No 2326174 Crankshaft Mounted lengthwise Rated rpm 2000 Bore and stroke 4½" x 5" Compression ratio 16.5 to 1 Displacement 336 cu in Cranking system 12 volt electric (two 12 volt batteries) Lubrication pressure Air cleaner dry type with replaceable pleated paper element and precleaner 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 8680874 Tread width rear 62" to 88" front 62" to 90" Wheel base 101" 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 29.4" Vertical distance above roadway 38.2" 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 eighth 6.2 ninth 7.7 tenth 10.2 eleventh 13.7 twelfth 17.0 reverse 3.1, 5.0, 7.7 and 17.0 Clutch multiple disc wet clutches within transmission actuated hydraulically Brakes dry double disc hydraulically power actuated by two foot pedals that can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 149" left 149" (on concrete surface without brake) right 173" left 173" Turning space diameter (on concrete surface with brake applied) right 309" left 309" (on concrete surface without brake) right 357" left 357" Belt pulley 1104 rpm at 1900 engine rpm diam 10½" face 7¼" Belt speed 3035 fpm Power take-off 1016 rpm at 1900 engine rpm or 538 rpm at 1900 engine rpm.

**REPAIRS and ADJUSTMENTS:** The threads on the fuel adjusting screw in the Diesel fuel pump were damaged, making it necessary to replace this part.

**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 to avoid excessive wheel slippage. Third, 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 1076.  
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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