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January 1971

## Test 1077: Case 870 Manual Diesel

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1077 - CASE 870 MANUAL 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 (PTO Speed—1070 rpm)</b>								
77.45	2000	5.037	0.454	15.38	192	60	75	28.950
<b>Standard Power Take-off Speed (1000 rpm)—One Hour</b>								
76.63	1870	4.958	0.452	15.46	193	62	76	28.930
<b>VARYING POWER AND FUEL CONSUMPTION—Two Hours</b>								
67.94	2068	4.352	0.447	15.61	186	62	75	.....
0.00	2186	1.413	.....	.....	180	61	75	.....
35.01	2132	2.784	0.555	12.58	185	62	74	.....
78.08	2000	5.108	0.457	15.29	192	63	75	.....
17.86	2158	2.105	0.823	8.48	182	63	75	.....
52.01	2104	3.527	0.474	14.75	184	63	75	.....
Av. 41.82	2108	3.215	0.537	13.01	185	62	75	28.927

## 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
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### VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST

<b>Maximum Available Power—Two Hours—4th Gear (4 Lo)</b>											
69.04	5130	5.05	1998	5.23	5.173	0.523	13.35	182	48	62	29.215
<b>75% of Pull at Maximum Power—Ten Hours—4th Gear (4 Lo)</b>											
56.18	3949	5.34	2085	3.98	4.181	0.519	13.44	179	49	61	29.218
<b>50% of Pull at Maximum Power—Two Hours—4th Gear (4 Lo)</b>											
38.30	2634	5.45	2105	2.83	3.222	0.587	11.89	185	57	78	28.860
<b>50% of Pull at Reduced Engine Speed—Two Hours—5th Gear (1 Hi)</b>											
38.68	2653	5.47	1746	2.57	3.007	0.542	12.87	186	58	81	28.865

### MAXIMUM POWER WITH BALLAST

47.87	9733	1.84	2089	14.85	1st Gear (1 Lo)	180	52	62	28.890
63.83	9526	2.51	1996	13.74	2nd Gear (2 Lo)	185	50	60	28.890
69.28	6870	3.78	2000	7.78	3rd Gear (3 Lo)	182	50	62	29.080
70.19	5230	5.03	1997	5.58	4th Gear (4 Lo)	182	49	61	29.080
69.80	4252	6.16	2000	4.37	5th Gear (1 Hi)	180	50	61	29.080
67.94	2903	8.78	2000	2.98	6th Gear (2 Hi)	179	52	64	29.080

### MAXIMUM PULL WITHOUT BALLAST

53.43	7668	2.61	2085	14.65	2nd Gear (2 Lo)	182	44	49	29.240
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### VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 4th Gear (4 Lo)

Pounds Pull	5230	5712	5940	6144	6273	6123
Horsepower	70.19	68.80	63.20	57.05	50.07	40.91
Crankshaft Speed rpm	1997	1807	1600	1403	1205	1008
Miles Per Hour	5.03	4.52	3.99	3.48	2.99	2.51
Slip of Drivers %	5.58	6.14	6.42	6.83	6.83	6.83

### TRACTOR SOUND LEVEL (with cab)

	<b>dB(A)</b>
Maximum Available Power 2 Hours	88.0
75% of Pull at Max. Power 10 Hours	89.0
50% of Pull at Max. Power 2 Hours	89.5
50% of Pull at Reduced Engine Speed 2 Hours	89.5
Bystander 8th gear (4 Hi)	87.0

### TIRES, BALLAST and WEIGHT

		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 18.4-34; 8; 15	Two 18.4-34; 8; 16
Ballast	—Liquid	1120 lb each	None
	Cast iron	560 lb each	None
Front tires	—No, size, ply & psi	Two 10.00-16; 6; 28	Two 10.00-16; 6; 28
Ballast	—Liquid	None	None
	Cast iron	45 lb each	None
Height of drawbar		16 inches	16 1/2 inches
Static weight with operator—rear		10590 lb	7230 lb
	front	2930 lb	2840 lb
	total	13520 lb	10070 lb

## Department of Agricultural Engineering

Dates of Test: September 12 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 2.677 gal. Drained from motor 2.011 gal. Transmission and final drive lubricant Case TCH oil Total time engine was operated 58 hours.

**ENGINE** Make CASE Diesel Type 4 cylinder Vertical Serial No. 2326344 Crankshaft Mounted lengthwise Rated rpm 2000 Bore and stroke 4 5/8" 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 pre-cleaner Oil filter full flow replaceable cartridge Fuel filter replaceable primary and secondary filter cartridges Muffler was used Cooling medium temperature control thermostat.

**CHASSIS** Type Standard Serial No. 8681075 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 28.7" Vertical distance above roadway 39.8" 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 2.0 second 2.9 third 4.1 fourth 5.0 fifth 6.3 sixth 8.9 seventh 12.6 eighth 15.8 reverse 2.56 and 7.93 Clutch single plate dry disc operated by foot pedal Brakes dry double disc hydraulically power actuated by two foot pedals which can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 149" left 149" (on concrete 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. 10 1/2" face 7 1/4" Belt speed 3036 fpm Power take-off 1016 rpm at 1900 engine rpm or 538 rpm at 1900 engine rpm

**REPAIRS and ADJUSTMENTS** Oil seal on exhaust valve in No. 4 cylinder was replaced during preliminary PTO runs.

**REMARKS:** All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Seventh and eighth gears were not run as test procedure permits only one gear over eight miles per hour.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1077.

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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