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January 1971

Test 1078: Case 970 Manual Diesel

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1078 – CASE 970 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
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1070 rpm)								
93.87	2000	6.033	0.449	15.56	189	61	75	28.940
Standard Power Take-off Speed (1000 rpm)—One Hour								
92.11	1870	5.939	0.450	15.51	189	61	74	28.955
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
82.46	2069	5.400	0.457	15.27	182	62	75	.....
0.00	2165	1.895	.....	.....	181	62	73	.....
42.46	2124	3.463	0.569	12.26	186	63	74	.....
93.50	2000	6.015	0.449	15.54	185	63	75	.....
21.21	2135	2.573	0.847	8.24	180	62	73	.....
62.83	2100	4.386	0.488	14.33	186	63	75	.....
Av 50.41	2099	3.955	0.548	12.75	183	62	74	28.960

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
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—4th Gear (4 Lo)											
79.90	6092	4.92	1998	6.42	5.907	0.516	13.53	187	66	91	28.730
75% of Pull at Maximum Power—Ten Hours—4th Gear (4 Lo)											
65.40	4676	5.24	2086	4.46	4.932	0.526	13.26	183	53	71	28.969
50% of Pull at Maximum Power—Two Hours—4th Gear (4 Lo)											
44.66	3124	5.36	2108	3.35	3.884	0.607	11.50	181	56	74	28.720
50% of Pull at Reduced Engine Speed—Two Hours—5th Gear (1 Hi)											
44.98	3140	5.37	1624	3.08	3.454	0.536	13.02	184	57	77	28.740
MAXIMUM POWER WITH BALLAST											
76.18	10644	2.68	2033	14.74	2nd Gear (2 Lo)			189	54	68	28.680
79.76	7535	3.97	1998	8.68	3rd Gear (3 Lo)			184	62	78	28.820
81.27	6209	4.91	1999	6.60	4th Gear (4 Lo)			183	64	82	28.820
79.83	4616	6.49	1997	4.82	5th Gear (1 Hi)			185	63	83	28.820
79.50	3216	9.27	1998	3.35	6th Gear (2 Hi)			185	64	85	28.820

MAXIMUM POWER WITHOUT BALLAST

62.12	8397	2.77	2095	14.76	2nd Gear (2 Lo)			177	52	59	29.130
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VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 4th Gear (4 Lo)

Pounds Pull	6209	6767	7120	7122	7150	6855
Horsepower	81.24	78.99	73.75	64.32	55.85	44.10
Crankshaft Speed rpm	1999	1800	1604	1399	1210	996
Miles Per Hour	4.91	4.38	3.88	3.39	2.93	2.41
Slip of Drivers %	6.75	7.62	7.90	7.90	8.04	7.76

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	88.5
50% of Pull at Reduced Engine Speed 2 Hours	88.0
Bystander—8th gear	88.5

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear tires	Two 18.4-38; 8; 20	Two 18.4-38; 8; 16
Ballast	1235 lb each	None
	Cast iron	None
Front tires	Two 11.0-16; 6; 28	Two 11.0-16; 6; 28
Ballast	None	None
	Cast iron	None
Height of drawbar	21 inches	21 inches
Static weight with operator—rear	11270 lb	7960 lb
front	3200 lb	3120 lb
total	14470 lb	11080 lb

Department of Agricultural Engineering

Dates of Test: September 9 to September 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 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 2.932 gal. Drained from motor 2.769 gal. Transmission and final drive lubricant Case TCH Oil Total time engine was operated 46½ hours.

ENGINE Make Case Diesel Type 6 cylinder vertical Serial No. 2325647 Crankshaft Mounted lengthwise Rated rpm 2000 Bore and stroke 4½" 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 8678556 Tread width rear 62" to 98" 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" Vertical distance above roadway 40.4" 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 2.7 and 7.7 Clutch single plate dry disc operated by a foot pedal Brakes dry double disc hydraulically power actuated with two foot pedals that 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 applied) right 380" left 380" Belt pulley 1108 rpm at 1900 engine rpm diam. 10½" face 7¼" Belt speed 3045 fpm Power take-off 1016 rpm at 1900 engine rpm and 538 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. Seventh and eighth gears were not run as new test procedure permits only one gear above eight mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1078.

L. F. LARSEN

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

D. E. LANE

Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
E. F. Frolik, Dean; H. W. Ottoson, Director; Lincoln, Nebraska