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January 1939

## Test 314: Caterpillar Model D-8 (Diesel) 850 r. p. m.

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UNIVERSITY OF NEBRASKA - AGRICULTURAL ENGINEERING DEPARTMENT  
 AGRICULTURAL COLLEGE, LINCOLN

Copy of Report of Official Tractor Test No. 314

Dates of test: November 28 to 30, 1938.

Name and model of tractor: CATERPILLAR DIESEL D-8 (850 R.P.M.)

Manufacturer: Caterpillar Tractor Company, Peoria, Illinois.

Manufacturer's rating: 97 Drawbar Horsepower Maximum in 2nd gear (standard conditions).

B E L T H O R S E P O W E R T E S T S

H. P.	Crank shaft speed R.P.M.	Fuel Consumption			Water used gal. per hr.	Temp. Deg. F.		Barometer Inches of Mercury
		Gal. per hr.	H. P. hr. per gal.	Lb. per H. P. hr.		Cooling med.	Air	
TESTS B AND C - 100% MAXIMUM LOAD - TWO HOURS								
109.64	850	7.029	15.60	0.449	0.000	165	58	28.980
*TEST D - ONE HOUR								
96.46	850	6.083	15.86	0.442	0.000	165	57	28.985
TEST E - VARYING LOAD - TWO HOURS (20 minute runs; last line average)								
96.21	850	6.107	15.75	0.445	--	165	58	--
1.69	931	1.999	0.85	8.290	--	158	57	--
50.44	890	3.971	12.70	0.552	--	160	58	--
105.75	839	6.732	15.71	0.446	--	165	60	--
25.98	911	2.966	8.76	0.800	--	159	58	--
74.21	873	4.960	14.96	0.469	--	162	59	--
59.05	883	4.456	13.25	0.529	0.000	161	58	28.965

D R A W B A R H O R S E P O W E R T E S T S

H. P.	Draw bar pull pounds	Speed miles per hr.	Crank shaft speed R.P.M.	Slip on drive wheels %	Fuel Consumption			Water used gal. per hr.	Temp. Deg. F.		Barometer Inches of Mercury
					Gal. per hr.	H. P. per gal.	Lb. per H.P. hr.		Cooling med.	Air	
TESTS F AND G - 100% MAXIMUM LOAD											
95.27	26,111	1.37	852	4.58	----- Not Recorded -----			159	33	28.815	
96.37	18,740	1.93	850	2.59	----- " " -----			160	38	28.805	
93.81	15,580	2.26	848	2.32	----- " " -----			161	47	28.960	
93.85	13,344	2.64	850	1.86	----- " " -----			162	54	28.910	
90.61	10,713	3.17	850	1.15	----- " " -----			163	60	28.900	
86.87	7,524	4.33	850	0.66	----- " " -----			163	62	28.880	

\*TEST H - TEN HOURS - Second - GEAR

73.71	14,249	1.94	850	2.06	5.525	13.34	0.525	0.000	158	37	28.890
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\*Formerly called RATED LOAD; see REMARKS 4, page 3.

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FUEL, OIL, AND TIME

Fuel Commercial diesel fuel Weight per gallon 7.01 pounds  
Oil: S.A.E. No. 20 To motor 8.168 gal. Drained from motor 5.505 gal.  
Total time motor was operated 43 hours

BRIEF SPECIFICATIONS

Advertised speeds, miles per hour: First 1.4 Second 2.0  
Third 2.3 Fourth 2.7 Fifth 3.2 Sixth 4.4 Reverse 1.4 - 2.3  
Belt pulley: Diameter 14 1/2" Face 13" R.P.M. 719  
Clutch: Make Own Type Single plate, dry Operated by hand  
Seat Upholstered  
Total weight as tested (with operator) 32,925 pounds

MOTOR:

Make Own Serial No. 1 H 3765 SP Type 6 cylinder, vertical, diesel  
Head I Mounting Crankshaft lengthwise Lubrication Pressure  
Bore and stroke 5 3/4" x 8" Rated R.P.M. 850  
Port diameter valves: Inlet 2 1/16" Exhaust 2 1/16"  
Fuel injection system: Own Serial No. 4P 2423  
Governor: Make Own Type Variable-speed, centrifugal  
Air Cleaner: Make Donaldson Type Oil-washed, wire-screen filter and  
collector pre-cleaner

CHASSIS:

Type Tracklayer Serial No. 1 H 3765 sp Drive Enclosed gear  
Tread width 78" Measured length of track 25.3931'  
Cleats: Type Integral with shoes No. per track 38  
Size 2 1/2" high x 20" long

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REPAIRS AND ADJUSTMENTS

No repairs or adjustments.

REMARKS

1. All results shown on page 1 of this report were determined from observed data and without allowances, additions, or deductions. Tests B and F were made with fuel pumps set to develop approximately 97 drawbar horsepower maximum in second gear under standard conditions, and data from these tests were used in determining the horsepower to be developed in tests D and H, respectively. Tests C, D, E, G, and H were made with the same setting.

	<u>DRAWBAR</u>	<u>BELT</u>
2. Observed maximum horsepower (tests F & B)	96.37	109.64
3. Sea level (calculated) maximum horsepower (based on 60° F. and 29.92" Hg.)	97.91	112.93
4. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly A.S.A.E. and S.A.E. ratings).	73.43	95.99

We, the undersigned, certify that the above is a true and correct report of official tractor test No. 314.

Carlton L. Zink  
Engineer-in-charge

E. E. Brackett

C. W. Smith

L. W. Hurlbut  
Board of Tractor Test Engineers