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Test 498: Intercontinental Model DF

Nebraska Tractor Test Lab

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The Experiment Station
University of Nebraska College of Agriculture
W. V. Lambert, Director, Lincoln, Nebraska

Department of Agricultural Engineering
Dates of test: July 24 to July 29, 1953
Manufacturer: INTERCONTINENTAL MFG. CO.
INC., GARLAND, TEXAS
Manufacturer's rating: Not rated.

NEBRASKA TRACTOR TEST NO. 498

INTERCONTINENTAL DF*

BELT HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercury
		Gal per hour	Hp-hr per gal	Lb per hp-hour		Cooling med	Air	
TESTS B & C—100% MAXIMUM LOAD—TWO HOURS								
33.84	1800	2.597	13.03	0.540	0.00	191	87	28.900
TEST D—RATED LOAD—ONE HOUR								
30.60	1801	2.271	13.47	0.523	0.00	180	85	28.905
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
30.64	1802	2.233	13.72	0.513	...	179	85	.....
2.10	1899	0.788	2.66	2.643	...	159	82	.....
15.79	1855	1.423	11.10	0.635	...	165	82	.....
32.33	1734	2.408	13.43	0.524	...	183	83	.....
8.00	1875	1.078	7.42	0.949	...	160	81	.....
23.37	1832	1.781	13.12	0.537	...	168	80	.....
18.71	1833	1.619	11.56	0.609	0.00	169	82	28.920

TORQUE (At Dynamometer)

Eng. RPM	1802	1702	1614	1503	1410	1310	1200	1087	989	895
Lb. ft.	174.8	172.2	171.0	170.6	172.0	178.2	179.6	176.8	170.6	160.3

DRAWBAR HORSEPOWER TESTS

Hp	Draw bar pull lb	Speed miles per hr	Crank shaft speed rpm	Slip of drive wheels %	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercury
					Gal per hour	Hp-hr per gal	Lb per hp-hr		Cool- ing med	Air	
TESTS F & G—100% MAXIMUM LOAD—3rd Gear											
30.04	3995	2.82	1709	9.55	.....	Not Recorded	.....	179	94	29.090
31.38	2755	4.27	1801	5.35	.....	Not Recorded	.....	180	87	29.090
31.02	1930	6.03	1799	4.43	.....	Not Recorded	.....	179	92	29.085
27.63	849	12.21	1800	1.53	.....	Not Recorded	.....	172	98	29.080
TEST H—RATED LOAD—TEN HOURS—2nd Gear											
25.04	2175	4.32	1802	4.51	2.017	12.41	0.567	0.00	178	93	28.865
TEST J—OPERATING MAXIMUM LOAD—2nd Gear											
24.07	2336	3.86	1803	15.31	.....	Not Recorded	.....	172	83	28.900
TEST K—OPERATING MAXIMUM LOAD—2nd Gear											
19.26	1931	3.74	1800	15.13	.....	Not Recorded	.....	175	96	28.900

TIRES, WHEELS and WEIGHT

	Tests F, G, & H	Test J	Test K
Rear wheels			
Type	Pressed steel	Pressed steel	Pressed steel
Liquid ballast	119 lb each	None	None
Added cast iron	1540 lb each	None	None
Rear tires			
No. and size	Two 11-38	Two 11-38	Two 10-38
Ply	6	6	4
Air pressure	18 lb	12 lb	12 lb
Front wheels			
Type	Pressed steel	Pressed steel	Pressed steel
Liquid ballast	None	None	None
Added cast iron	172 lb each	None	None
Front tires			
No. and size	Two 5.50-16	Two 5.50-16	Two 5.50-16
Ply	4	4	4
Air pressure	28 lb	28 lb	28 lb
Height of drawbar	19 inches	20 inches	19 inches
Static weight			
Rear end	5516 lb	2198 lb	2134 lb
Front end	1562 lb	1218 lb	1206 lb
Total weight as tested with operator	7253 lb	3591 lb	3515 lb

* Also designated as Federal DF.

FUEL, OIL and TIME Diesel Fuel cetane No 50 (rating taken from oil company's typical inspection data); weight per gallon 7.040 lb Oil SAE 20; to motor 1.234 gal; drained from motor 0.457 gal Total time motor was operated 40 hours.

CHASSIS Type Tricycle Serial No. None Tread width rear 56" to 84" front 9" Wheel Base 81" Hydraulic control system Direct engine drive Advertised speeds mph first 3.08 second 4.45 third 6.19 fourth 12.27 reverse 3.83 Belt pulley diam 10" face 6½" rpm 1475 Belt speed 3814 fpm Clutch Single plate dry disc clutch operated by foot pedal Seat pressed steel Brakes External and internal shoe operated by two foot pedals Equalized by locking brakes together Power take-off Standard type.

ENGINE Make Buda Type 4 cylinder vertical diesel Serial No 53402 Crankshaft mounted length-wise Head I Lubrication pressure Bore and Stroke 3¼" x 4½" Rated rpm 1800 Compression ratio 15 to 1 Displacement 182 cu in. Port Diameter Valves Inlet 1½" Exhaust 1½" Governor Variable speed centrifugal Starting System two 6 volt batteries Air Cleaner oil washed wire mesh Muffler was used Oil Filter replaceable cartridge Fuel Filter One replaceable element and one replaceable cartridge Cooling medium temperature control Thermostat.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS All test results were determined from observed data and without allowances, additions or deductions. Tests B and F were made with fuel pump set by manufacturer to develop approximately 36 corrected maximum belt horsepower and data from these tests were used in determining the horsepower to be developed in tests D and H, respectively. Tests B, C, D, E, F, G, H, J, & K were made with the same setting.

HORSEPOWER SUMMARY

	Draw-bar	Belt
1. Sea level (calculated) maximum horsepower (based on 60°F and 29.92" HG)	33.10	35.93
2. Observed maximum horsepower (tests F & B)	31.38	33.84
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly ASAE and SAE ratings)	24.83	30.54

We, the undersigned, certify that this is a true and correct report of official tractor test No. 498.

L. F. LARSEN
Engineer-in-Charge

C. W. SMITH
L. W. HURLBUT
F. D. YUNG
Board of Tractor
Test Engineers

EXPLANATION OF TEST REPORT

TEST A: The manufacturer's representative operates the tractor for a minimum of 12 hours using light to heavy drawbar loads in each gear.

This serves as a period for limber up, general observation and adjustments. Adjustments that are permissible include valve tappet clearance, breaker point gap, spark plug gaps, clutch and others of a similar nature. No new parts or accessories can be installed without having mention made of it in the report.

No data are recorded during this preliminary run except the time that the engine is operated.

BELT HORSEPOWER TESTS

TEST B: The throttle valve is held wide open and the belt load on the dynamometer is adjusted so that the engine is at the rated speed recommended by the manufacturer. Carburetor, ignition timing and manifold adjustments are all set for maximum engine power.

This test is designed to determine maximum belt horsepower of the tractor at rated speed and to measure fuel consumption at the maximum power on the belt.

TEST C: For tractors with carburetors the best fuel economy does not always occur when the engine develops maximum power at rated speed. Test C is intended to allow the manufacturer's representative to select a more economical fuel setting even though there is a slight loss of power. *This more practical carburetor setting is used in all later tests except test F.* The throttle valve is held wide open and load adjusted to give rated rpm. Tests B and C are the same for diesel tractors, which have an altogether different fuel system.

TEST D: The throttle control lever is set so that the governor will maintain rated engine speed when rated load is applied. Rated load is 85% of 100% maximum, as obtained in test B, corrected to standard conditions.

This rating is somewhat less than the maximum belt horsepower in order that the operator may have a certain amount of reserve.

TEST E:

Varying load serves to show the range of engine speeds when the engine is controlled by the governor during the following varied loads of 20 minutes each: rated load, no load, $\frac{1}{2}$ rated load, maximum load at wide open throttle valve, $\frac{1}{4}$ and $\frac{3}{4}$ rated load.

The average result of this test shows the average power and fuel consumption. Since the average tractor is subjected to varying loads, these data serve well in predicting fuel consumption and efficiency of a tractor in general use.

Torque, lb-ft at dynamometer, is obtained with wide open throttle and sufficient load is applied to give several readings.

DRAWBAR HORSEPOWER TESTS

In all drawbar tests the pull exerted by the tractor is transmitted by a hydraulic pressure cylinder to a recording instrument in the test car. All tests are made on the same dirt test course which is maintained by grading, sprinkling and rolling so that it remains very nearly the same throughout the season.

The same tires, wheels and weights are used for all tests except J and K.

TEST F: A drawbar test, the results of which are used to determine the rated drawbar horsepower in test H. The carburetor is set to develop maximum power as in test B. The rated gear recommended by manufacturer as plow gear is used in this test. The drawbar load is adjusted to give rated engine speed.

TEST G: Maximum drawbar horsepower is determined in each gear when the carburetor is set for fuel economy as in test C. The throttle valve is held wide open and the load is applied so that the engine runs at rated engine speed.

When operating in low gear it is not uncommon for the tractor to develop less drawbar horsepower than in rated gear because of excessive wheel slippage. When excessive wheel slippage occurs the load is reduced until slippage approaches 16%. When the load is reduced it is necessary to operate the tractor engine at part throttle and control engine speed by governor action.

TEST H: Intended to test the ability of the tractor to run continuously for 10 hours at rated drawbar horsepower and to determine the fuel consumption during that time. Rated drawbar horsepower is 75% of 100% maximum drawbar horsepower (Test F), corrected to standard conditions.

When operating at rated load the throttle control lever is set to maintain rated engine speed. This rating is less than maximum drawbar horsepower in order that the operator may have a certain amount of reserve.

TEST J: The tractor is operated in rated gear with all added weight removed. This test shows the effect of the removal of added weight on the performance of the tractor when compared with test G.

Removal of wheel weights generally increases wheel slippage and decreases drawbar horsepower.

TEST K: Similar to test J except that the smallest tires and lightest wheels offered by the manufacturer are used.

