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1951

## Test 462: International TD-6

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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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: June 25 to July 10, 1951.  
Manufacturer: INTERNATIONAL HARVESTER  
CO., CHICAGO, ILLINOIS  
Manufacturer's rating: Drawbar 31.3, Belt  
37.8 (Observed maximum hp).

NEBRASKA TRACTOR TEST NO. 462

INTERNATIONAL TD-6

**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 and C—100% MAXIMUM LOAD—TWO HOURS								
38.20	1450	2.683	14.24	0.483	0.00	185	79	28.880
TEST D—RATED LOAD—ONE HOUR								
34.38	1451	2.428	14.16	0.485	0.00	185	83	28.850
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
34.14	1449	2.427	14.07	0.489	...	184	83	.....
1.39	1518	0.860	1.62	4.252	...	185	83	.....
17.47	1474	1.523	11.47	0.599	...	185	83	.....
35.47	1380	2.510	14.13	0.486	...	185	85	.....
8.85	1491	1.135	7.80	0.881	...	190	85	.....
25.92	1461	1.964	13.20	0.521	...	184	85	.....
20.54	1462	1.737	11.82	0.581 *	0.00	185	84	28.845

**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 and G—100% MAXIMUM LOAD											
31.59	8131	1.46	1451	4.29	—Not Recorded—				166	82	28.840
31.75	5514	2.16	1449	2.36	—Not Recorded—				177	87	28.840
30.55	3742	3.06	1453	2.36	—Not Recorded—				189	76	28.775
30.08	2992	3.77	1449	1.64	—Not Recorded—				180	74	28.775
27.31	1903	5.38	1449	0.70	—Not Recorded—				172	74	28.775
TEST H—RATED LOAD—TEN HOURS—2nd GEAR											
25.45	4406	2.17	1452	2.27	2.170	11.73	0.586	0.00	178	91	28.760

**FUEL, OIL and TIME** Diesel fuel cetane No. 47 (rating taken from oil company's typical inspection data); weight per gallon 6.873 lb Oil SAE 20; to motor 2.265 gal; drained from motor 1.868 gal Total time motor was operated 65 hours.

**CHASSIS** Type tracklayer Serial No TDBK29165 Tread width 50" Track 58 3/8" Cleats integral with shoes Cleats per track 32 Size of cleats 18"x6" Advertised speeds mph first 1.5 second 2.2 third 3.1 fourth 3.8 fifth 5.4 reverse 1.7 Belt pulley diam 12 1/2" face 8 1/2" rpm 811 Belt speed 2654 fpm Clutch single plate over center operated by hand lever Seat upholstered Brakes contracting bands operated by two foot pedals Steering hand levers controlling multiple disk clutches.

**ENGINE** Make International Diesel Type 4 cylinder vertical Serial No UBKM 13369 Crankshaft mounted lengthwise Head I Lubrication pressure Bore and Stroke 3 3/8"x5 1/4" Rated rpm 1450 Compression ratio 16.8 to 1 Displacement 247.7 cu in Port Diameter Valves inlet 1 1/2" exhaust 1 5/16" Governor fly ball variable speed Carburetor Size 3/4" (for starting only) Ignition System magneto (for starting only) Starting System 12 volt Air Cleaner oil washed crimped wire screen Muffler was used Oil Filter one by-pass replaceable radial fin paper element Fuel Filter auxiliary and final replaceable paper elements Cooling medium temperature control thermostat and shutter.

**TOTAL WEIGHT AS TESTED** (with operator)—8585 lbs.

**REPAIRS AND ADJUSTMENTS** Before starting tests F & G, the right hand track was loosened and the 16" clipped shoes were replaced with 18" square shoes.

**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 40.2 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 C, D, E, G, and H 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)	33.78	40.29
2. Observed maximum horsepower (tests F & B)	31.75	38.20
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)	25.34	34.25

We, the undersigned, certify that this is a true and correct report of official tractor test No. 462.

L. F. Larsen  
Engineer in Charge

C. W. Smith  
F. D. Yung  
L. W. Hurlbut  
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 preliminary period for limber up, general observation and adjustments. No data are recorded during this preliminary run.

### 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 as near as practical to the rated speed recommended by the manufacturer. Carburetor, ignition timing and manifold adjustments are all set for maximum engine power.

**TEST C:** The manufacturer has an opportunity to select a more practical carburetor setting which may slightly lower the power output but give better fuel economy. As in test B, the throttle valve is held wide open and the load is adjusted to give the rated engine speed. Tests B and C may be the same, as in the case of a diesel engine where the manufacturer wants to use the same setting as in test B. The same setting is used for tests D, E, G, H, J and K.

**TEST D:** The throttle control lever is set so 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.

**TEST E:** This test serves to show how well the governor controls the engine speed when the following loads are applied: rated load, no load,  $\frac{1}{2}$  load, maximum load at wide-open throttle,  $\frac{1}{4}$  load and  $\frac{3}{4}$  load. This test also shows some significant fuel consumption results for these loads. The average fuel consumption given for this test is quite significant. The average farm tractor is subjected to a varying load condition throughout the year.

### 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:** The tractor is operated in the gear designated by the manufacturer as rated gear (the gear recommended as most suitable for plowing). The carburetor is set as in test B. The throttle valve is held wide open and the drawbar load adjusted to maintain rated engine speed. Results of this test are used to determine the rated load for test H.

**TEST G:** The tractor is tested for maximum drawbar horsepower in each gear, using the more efficient carburetor setting as determined 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 the lower gears the tractor often is unable to develop maximum horsepower because of excessive wheel slippage. Then the load is reduced until slippage approaches 16%.

**TEST H:** This test lasts 10 hours and is the only drawbar test where fuel consumption is measured. The load applied is 75% of 100% maximum drawbar horsepower (test F) corrected to standard conditions. The throttle lever is set so that the governor gives rated engine speed.

**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.

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

