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Test 1198: Kubota L 285 Diesel

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1198 – KUBOTA L 285 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—626 rpm)								
26.45	2400	1.833	0.479	14.42	210	55	75	28.900
Standard Power Take-off Speed (540 rpm)—One Hour								
23.58	2070	1.612	0.472	14.63	212	56	75	28.865
VARYING POWER AND FUEL CONSUMPTION								
23.36	2493	1.629	0.482	14.34	198	56	75	.....
0.00	2652	0.495	.....	.....	178	56	74	.....
12.08	2580	1.030	0.589	11.73	180	55	74	.....
26.94	2400	1.881	0.482	14.32	205	56	75	.....
6.11	2613	0.773	0.873	7.91	177	54	72	.....
17.94	2552	1.295	0.498	13.86	183	56	75	.....
Av 14.41	2548	1.184	0.567	12.16	187	55	74	28.823

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 5th (1-H) Gear											
22.17	1783	4.66	2395	7.61	1.883	0.586	11.78	192	42	46	28.905
75% of Pull at Maximum Power—Ten Hours 5th (1-H) Gear											
19.24	1442	5.00	2530	6.11	1.582	0.568	12.16	180	28	28	29.125
50% of Pull at Maximum Power—Two Hours 5th (1-H) Gear											
12.73	922	5.18	2572	4.46	1.195	0.648	10.65	180	40	40	28.560
50% of Pull at Reduced Engine Speed—Two Hours 6th (2-H) Gear											
12.72	922	5.17	1850	4.16	1.032	0.560	12.33	179	29	31	28.585
MAXIMUM POWER WITH BALLAST											
18.84	3134	2.25	2525	14.91	4th Gear (4-L)			181	24	24	29.300
22.48	1805	4.67	2402	7.64	5th Gear (1-H)			199	49	56	28.790
22.94	1300	6.62	2403	5.50	6th Gear (2-H)			192	46	52	28.820
22.53	937	9.01	2403	4.16	7th Gear (3-H)			190	45	50	28.830

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST 5th (1-H) Gear

Pounds Pull	1805	1855	1904	1886	1899	1835
Horsepower	22.48	20.70	18.81	16.16	13.99	11.31
Crankshaft Speed rpm	2402	2158	1915	1660	1428	1192
Miles Per Hour	4.67	4.18	3.71	3.21	2.76	2.31
Slip of Drivers %	7.64	8.01	8.28	8.19	8.19	8.01

TRACTOR SOUND LEVEL WITHOUT CAB db(A)

Maximum Available Power 2 Hours	91.0
75% of Pull at Max. Power 10 Hours	89.5
50% of Pull at Max. Power 2 Hours	88.0
50% of Pull at Reduced Engine Speed 2 Hours	85.5
Bystander in 8th (4-H) Gear	79.0

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 12.4-24; 4; 14
Ballast	—Liquid	210 lb each
	Cast Iron	432 lb each
Front Tires	—No., size, ply & psi	Two 5.00-15; 4; 32
Ballast	—Liquid	None
	Cast Iron	150 lb each
Height of drawbar	18 inches	18 inches
Static weight with operator—rear	2800 lb	1515 lb
front	1230 lb	930 lb
total	4030 lb	2445 lb

Department of Agricultural Engineering

Dates of Test:: November 4 to December 5, 1975

Manufacturer: KUBOTA LTD. 22, Funade-cho
2chome, Naniwa-ku, Osaka, Japan

FUEL, OIL AND TIME Fuel No. 2 Diesel
Cetane No. 51.7 (rating taken from oil com-
pany's typical inspection data) Specific gravity
converted to 60°/60° 0.8293 Weight per gallon
6.905 lb Oil SAE 20-20W API service classifica-
tion SB/SE-CA/CD To motor 1.976 gal
Drained from motor 1.717 gal Transmission
and final drive lubricant SAE 80 Total time
engine was operated 61.5 hours.

ENGINE Make Kubota, Ltd. Type four
cylinder vertical Serial No. V1500-A-1300
Crankshaft mounted lengthwise Rated rpm
2400 Bore and stroke 2.992" x 3.228" Compres-
sion ratio 21 to 1 Displacement 91 cu. in.
Cranking system 12 volt Lubrication pressure
Air cleaner paper element with cyclonic pre-
cleaner Oil filter full flow paper cartridge
Fuel filter treated paper cartridge Muffler
underslung Cooling medium temperature con-
trol thermostat.

CHASSIS Type standard Serial No. L 285-
10481 Tread width rear 40.1" to 61.8" front
40.1" to 55.9" Wheel base 67" Center of grav-
ity (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 27.8" Vertical distance
above roadway 24.9" Horizontal distance from
center of rear wheel tread 0" to the right/left
Hydraulic control system direct engine drive
Transmission selective gear fixed ratio Adver-
tised speeds mph first 1.2 second 1.7 third 2.3
fourth 2.9 fifth 5.5 sixth 7.7 seventh 10.3 eighth
12.3 reverse 1.7 and 10.3 Clutch single plate dry
disc operated by foot pedal Brakes internal ex-
panding shoes operated by two foot pedals that
can be locked together Steering mechanical
Turning radius (on concrete surface with brake
applied) right 93" left 93" (on concrete surface
without brake) right 113" left 113" Turning
space diameter (on concrete surface with brake
applied) right 200" left 200" (on concrete sur-
face without brake) right 238" left 238" Power
take-off 540 rpm at 2070 engine rpm and 1000
rpm at 2105 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. Fuel temperature at injection
pump return was 133°F. Four gears were chosen
between 15% slip and 15 mph (only one gear
permitted over 8 mph).

We, the undersigned, certify that this is a true
and correct report of official Tractor Test 1198.

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

D. E. LANE
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories may be disconnected only when the means for disconnecting can be reached from the operator station. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of Automotive Engineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. Prior to the maximum power run the tire tread-bar height must be at least 65% of new tread height.

POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representative makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, $\frac{1}{2}$ of the 85% torque; maximum power, $\frac{1}{4}$ and $\frac{3}{4}$ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general use.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effects of speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 4 different runs as follows: (1) as near to the pull at maximum power as

possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; (3) 50% of the pull at maximum power; and (4) maintaining the same load and travel speed as in (3) by shifting to a higher gear and reducing the engine rpm.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 6 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe limit for the test course. The manufacturer's representative has the option of selecting one gear or speed over eight miles per hour. The maximum safe speed for the Nebraska Test Course has been set at 15 mph. The slip limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Varying Drawbar Pull and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions: (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

SOUND MEASUREMENT

Sound is recorded during each of the Varying Power and Fuel Consumption runs as the tractor travels on a straight section of the test course. The dB(A) sound level is obtained with the microphone located near the right ear of the operator. Bystander sound readings are taken with the microphone placed 25 feet from the line of travel of the tractor.

An increase of 10 dB(A) will approximately double the loudness to the human ear.

For additional information about the Nebraska Tractor Tests write to the Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska 68583.



KUBOTA L 285 DIESEL