7-30-1965

Test 906: Kubota RV (Gasoline)

Nebraska Tractor Test Lab
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NEBRASKA TRACTOR TEST 906 - KUBOTA RV GASOLINE

BELT PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours								
8.81	2000	0.966	0.669	9.12	186	65	74	28.873
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS								
8.01	2137	0.975	0.742	8.22	186	67	78	.....
0.44	2269	0.537	7.432	0.82	158	67	78	.....
4.14	2195	0.758	1.116	5.46	174	66	80	.....
8.79	1999	0.975	0.676	9.02	193	67	81	.....
2.11	2234	0.630	1.820	3.35	166	67	82	.....
6.06	2159	0.852	0.856	7.11	184	68	83	.....
Av 4.93	**2165**	**0.788**	**0.974**	**6.26**	**177**	**67**	**80**	**28.870**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barom-eter inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—5th Gear											
6.76	622	4.08	2013	12.19	0.957	0.863	7.06	205	69	86	28.705
75% of Pull at Maximum Power—Ten Hours—5th Gear											
5.48	460	4.47	2125	9.12	0.835	0.929	6.56	195	69	84	28.783
50% of Pull at Maximum Power—Two Hours—5th Gear											
3.93	304	4.85	2245	6.80	0.754	1.169	5.21	198	72	93	28.690
MAXIMUM POWER WITH BALLAST											
5.16	721	2.68	2136	14.87	4th Gear			185	66	75	28.730
6.78	632	4.02	2002	12.94	5th Gear			196	66	80	28.730
6.58	342	7.21	2000	7.61	6th Gear			199	68	83	28.730
MAXIMUM POWER WITHOUT BALLAST											
6.84	633	4.05	2004	10.53	5th Gear			202	67	79	28.820

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—5th Gear

Pounds pull	632	655	652	665	624	629
Horsepower	6.78	6.28	5.52	4.92	3.99	3.33
Crankshaft speed rpm	2002	1798	1588	1391	1193	991
Miles per hour	4.02	3.60	3.18	2.77	2.40	1.99
Slip of drivers, %	12.94	13.31	13.31	13.54	12.99	13.13

TIRES, BALLAST and WEIGHT		**With Ballast**	**Without Ballast**
Rear tires	—No, size, ply & psi	Two 6.00-12; 2; 14	Two 6.00-12; 2; 14
Ballast	—Liquid	None	None
	Cast iron	85 lb each	None
Front tires	—No, size, ply & psi	Two 4.00-9; 2; 20	Two 4.00-9; 2; 20
Ballast	—Liquid	None	None
	Cast iron	31 lb each	None
Height of drawbar		17½ inches	17 inches
Static weight	—Rear	786 lb	616 lb
	Front	558 lb	496 lb
Total weight with operator		1519 lb	1287 lb

Department of Agricultural Engineering

Dates of Test: July 30 to August 6, 1965

Manufacturer: KUBOTA IRON and MACHINERY WORKS, LTD., OSAKA, JAPAN

FUEL, OIL and TIME Fuel regular gasoline **Octane No** Motor 85.2 Research 92.3 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.7321 **Weight per gallon** 6.095 lb **Oil** SAE 30 **API service classification** MS, DM **To motor** 0.646 gal **Drained from motor** 0.595 gal **Transmission and final-drive lubricant** SAE 90 **Total time engine was operated** 36½ hours.

ENGINE Make KUBOTA GASOLINE **Type** single cylinder horizontal **Serial No** CZR3112299 **Crankshaft mounted** crosswise **Rated rpm** 2000 **Bore and stroke** 3.74″ x 3.54″ **Compression ratio** 5.7 to 1 **Displacement** 38.5 cu in **Carburetor size** ¾″ **Ignition system** battery **Cranking system** 12 volt electric **Lubrication** pressure **Air cleaner** oil washed wire screen **Oil filter** wire mesh **Fuel filter** sediment bowl and screen **Muffler** was used **Cooling medium temperature control** thermo-siphon.

CHASSIS Type standard **Serial No** RV 12425 **Tread width** rear 25.3″ to 35.1″ front 26.4″ to 32.9″ **Wheel base** 43.5″ **Center of gravity** (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 14″ Vertical distance above roadway 13″ Horizontal distance from center of rear wheel tread 0″ to the right/left **Hydraulic control system** none **Transmission** selective gear fixed ratio with vee belt drive from engine **Advertised speeds mph** first 0.6 second 1.0 third 1.75 fourth 2.37 fifth 4.84 sixth 8.2 reverse 0.66 and 2.37 **Clutch** dry multiple type disc **Brakes** internal expanding shoe operated by two foot pedals **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 81″ left 80″ (on concrete surface without brake) right 108″ left 106″ **Turning space diameter** (on concrete surface with brake applied) right 168″ left 166″ (on concrete surface without brake) right 222″ left 218″ **Belt pulley** 2000 rpm at 2000 engine rpm diam 6½″ vee Belt speed 2185 fpm Power take-off none.

REPAIRS and ADJUSTMENTS No repairs or adjustments.

REMARKS All test results were determined from observed data obtained in accordance with the SAE and ASAE test code.

First, second and third gears were not run as it was necessary to limit the pull in fourth gear to avoid excessive wheel slippage.

Water in tractor radiator boiled intermittently during the two hour maximum available power run. A crosswind prevailed during the run.

Tire wear lowered both wheel slippage and drawbar height for the no ballast run.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 906.

L. F. LARSEN

Engineer-in-charge

G. W. STEINBRUEGGE, Chairman
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EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories can be disconnected only when it is convenient for the operator to do so in practice. 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. The tire tread-bar height must be at least 65% of new tread height prior to the maximum power run.

BELT OR POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representaitve 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 belt pulley or 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, ½ of the 85% torque; maximum power, ¼ and ¾ 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 usage.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests. If the manufacturer specifies a different rated crankshaft speed for drawbar operations, then the position of the manually operated governor control is changed to provide the high-idle speed specified by the manufacturer in the operating instructions.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effect 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 3 different levels 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; and (3) 50% of the pull at maximum power. Prior to 1958, fuel consumption data (10 hour test) were shown only for the pull obtained at maximum power for tractors having torque converters and at 75% of the pull obtained at maximum power for gear-type tractors.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 12 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 maximum safe speed for the Nebraska Test Course has been set at 15 miles per hour. The slippage limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Maximum Power Without Ballast. All added ballast is removed from the tractor. The maximum drawbar power of the tractor is determined by the same procedure used for getting maximum power with ballast. The gear (or travel speed) is the same as that used in the 10-hour test.

Varying Power 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.

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

Kubota RV Gasoline