11-19-1951

Engine Test 1 Petter AVA2 Diesel

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: November 19 to November 27, 1951
Manufacturer: PETTERS LTD., DIVISION BRUSH ABOE, LONDON, ENGLAND
Manufacturer's rating: 10.5 hp at 1800 rpm.

NEBRASKA ENGINE TEST NO. 1

PETTER AVA2 DIESEL ENGINE

FUEL, OIL and TIME Diesel fuel cetane No 47 (rating taken from oil company's typical inspection data); weight per gallon 7.011 lb **Oil** SAE 20; to motor 1.756 gal; drained from motor 1.558 gal **Total time motor was operated** 28½ hours.

ENGINE Make Petter **Type** 2 cylinder vertical air cooled Diesel **Serial No** 900156 **Head I Lubrication** pressure **Bore and Stroke** 3.15″ x 4.33″ **Rated rpm** 1000-1800 **Compression ratio** 16.5 to 1 **Displacement** 67.6 cu in **Port Diameter Valves** inlet 1¼″ exhaust 1¼″ **Governor** variable speed centrifugal **Starting System** hand crank **Air Cleaner** oil bath **Muffler** not used **Oil Filter** by-pass replaceable element **Cooling medium temperature control** air cooled.

REMARKS All test results shown are from observed data. Test B was made with the fuel pump set by the manufacturer to develop the engine's normal industrial intermittent rating. Data from this test were used to determine the belt horsepower to be developed in tests D and E.

BELT HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Fuel Consumption			Water used gal per hr	Temp Deg F		Barometer inches of mercury
		Gal per hr	Hp-hr per gal	Lb per hp-hour		Cooling med	Air	
TESTS B and C—100% MAXIMUM LOAD—TWO HOURS								
9.19	1502	0.611	15.04	0.466	—Air Cooled—		64	29.000
TEST D—RATED LOAD—ONE HOUR								
8.13	1500	0.535	15.20	0.461	—Air Cooled—		66	28.970
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
8.15	1497	0.535	15.23	0.460	.....		67	.....
2.59	1607	0.270	9.59	0.730	.....		67	.....
4.42	1598	0.342	12.92	0.543	.....		68	.....
8.79	1425	0.578	15.21	0.461	.....		68	.....
2.55	1610	0.261	9.77	0.718	.....		70	.....
6.41	1559	0.432	14.84	0.473	.....		70	.....
5.49	1545	0.404	13.59	0.515	—Air Cooled—		68	28.970

DIRECT CONNECTED BRAKE HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Torque lb-ft.	Fuel used lb per bhp-hr	Temperature Degrees F					Barometer inches of mercury
				Exhaust	Oil	Cooling air In	Cooling air Out	Air	
PEAK HORSEPOWER (for temporary overload condition only) 5 min run each speed									
7.63	999	40.10	0.440	990	132	68	184	69	29.000
9.34	1198	40.97	0.463	1050	135	69	176	70	29.000
11.22	1496	39.40	0.471	1130	135	86	194	86	29.000
13.50	1808	39.22	0.471	1250	140	86	178	82	29.000
INTERMITTENT HORSEPOWER (power available not exceeding one hr) 10 min run each speed									
6.36	1004	33.62	0.443	820	135	82	182	80	29.040
7.96	1200	34.84	0.445	910	135	84	184	82	29.040
9.95	1500	35.02	0.428	940	128	81	136	82	29.040
12.03	1796	35.20	0.459	1060	140	87	138	86	29.040
CONTINUOUS HORSEPOWER (Recommended for continuous service) 10 min run each speed									
6.02	1004	31.52	0.429	770	128	76	148	76	29.040
7.19	1199	31.52	0.426	800	130	80	140	77	29.040
8.99	1498	31.52	0.427	830	130	76	158	75	29.040
10.76	1793	31.52	0.452	900	135	82	138	80	29.040

HORSEPOWER SUMMARY AT 1500 RPM

Belt Tests

1. Sea level (calculated) maximum horsepower (based on 60° F and 29.92″ Hg) 9.52
2. Observed maximum horsepower (test B) 9.19
3. Eighty-five per cent of calculated maximum belt horsepower 8.09

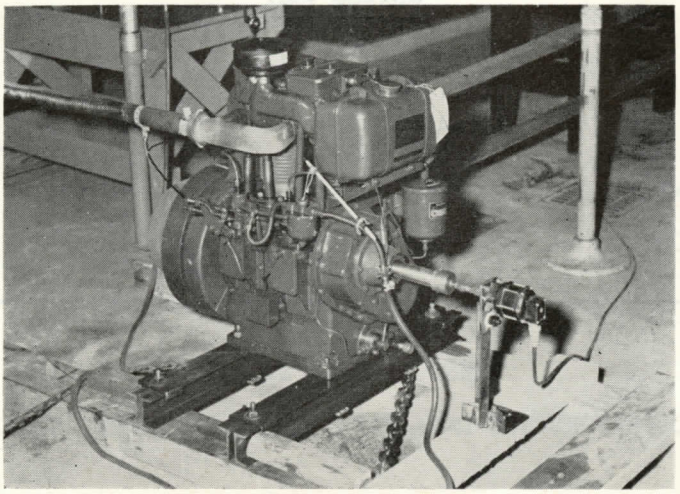
Direct Connected Test

1. Observed industrial continuous horsepower 8.99

We, the undersigned, certify that this is a true and correct report of official engine test No. 1.

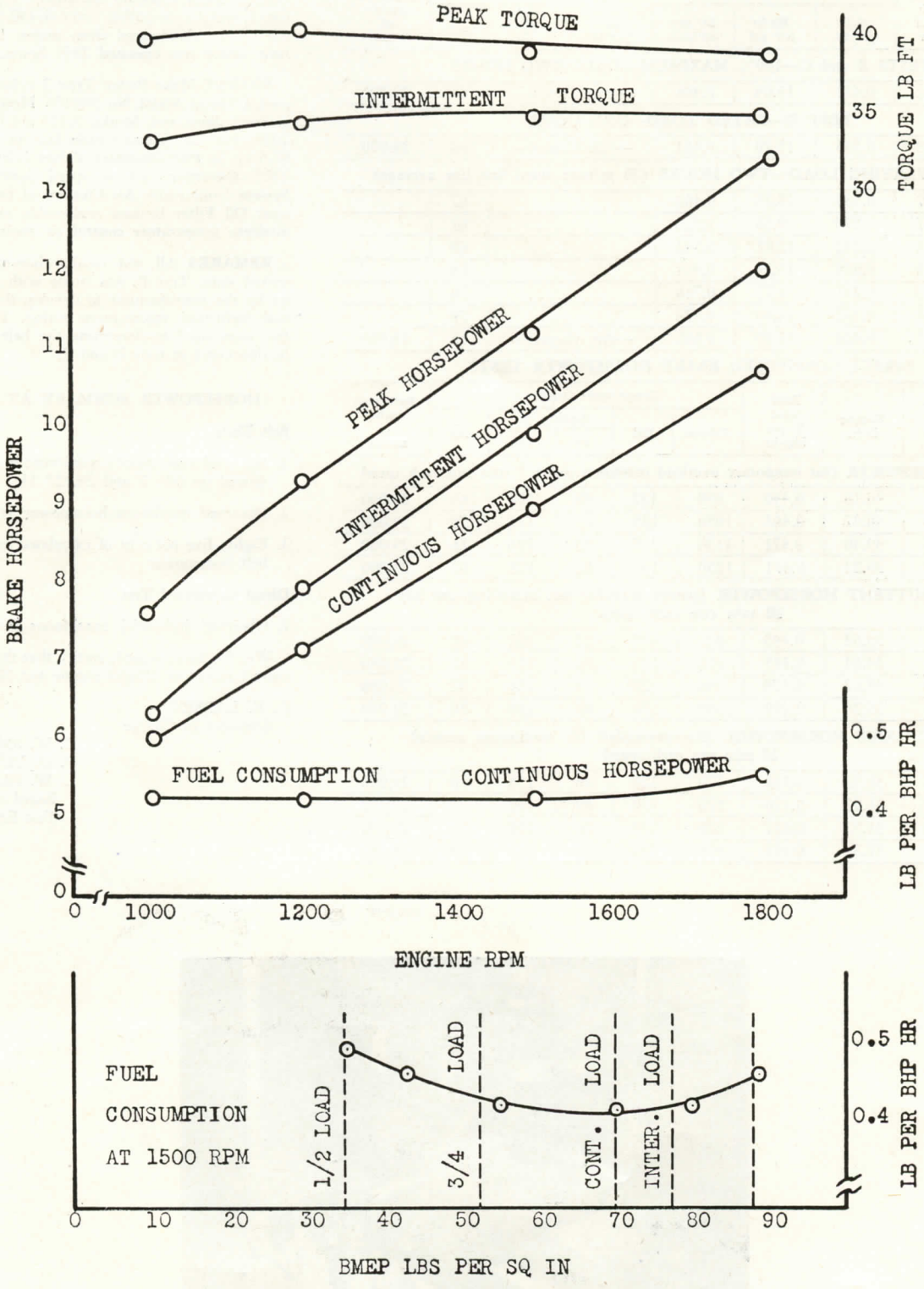
L. F. LARSEN
Engineer in Charge

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



Belt horsepower test.

PETTER MODEL AVA2 AIR COOLED DIESEL ENGINE



OBSERVED PERFORMANCE DATA WITH DIRECT CONNECTED DYNAMOMETER