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Calibration: Fischer and Porter: flow meter model 10C1505X2: serial 6301A3375A19
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FIG.
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Engine Laboratory

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FOR
POUR Canadian Aviation Electronics

REFERENCE
RÉFÉRENCE Letter of Oct. 12, 1965 to Mr. M.S. Kuhring from Mr. A.W. Egerton of Canadian Aviation Electronics requesting calibration of Fischer and Porter Flow Meters.

LTR-ENG-5

Calibration
FISCHER and PORTER
Flow Meter
Model 10C1505X2
Serial 6301A3375A19

SUBMITTED BY
PRÉSENTÉ PAR Mr. M.S. Kuhring
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1. INTRODUCTION

At the request of C.A.E. Ltd., Montreal, a volumetric calibration of a turbine type flow meter was carried out, using water as the test fluid.

2. EXPERIMENTAL APPARATUS

The water was taken from an overhead reservoir, filtered, and then fed to a vane pump. The outlet of the pump was fitted with a by-pass line and valve to help regulate the flow. A flow control valve fed the water through a flexible hose to a straight pipe connected to the inlet of the transducer and a similar pipe was fitted to the transducer outlet. A hose then carried the fluid to a fifty-gallon tank, fitted with waste valve and mounted on a platform scale. The straight pipes on the inlet and outlet of the flow meter were of a length in excess of twenty diameters of the bore of the transducer. The electrical output of the flow meter was indicated on an electronic counter.

3. TEST PROCEDURE

The method used to calibrate the unit was to establish the weight of fluid pumped through the transducer over a given time, while the number of pulses generated by the meter was totaled on the electronic counter.

Fifty-pound weights, accurate to better than 0.1 percent were placed on top of the tank. A flow was set up and the waste valve on the tank was closed. When the scale balanced, the counter, and at the same time a stop watch, were started. The weights were then removed and, when the scale balanced again, the counter and watch were stopped. The weight of fluid in the tank equalled the weights removed, thus eliminating the error of the scale calibration.

At least thirteen points were recorded over the specified range of interest. The temperature and specific gravity of the water were measured; the specific gravity was determined to four decimal places, using a Westphal balance.

Because this type of transducer is not linear over the range of interest a K factor of cycles/gallon was requested. The data were plotted as rate of flow in lb./hr. against K factor and the mean point between the maximum and minimum points in the range of interest was taken as the mean K factor.

Two K factors were computed, one for Imperial gallons, and one for U.S. gallons. the conversion factor used was 1.2009 U.S. gallons to one Imperial gallon.

4. CONCLUSION

A K factor of 44488 cycles/U.S. gallon was measured over the range 330 lb./hr. to 1090 lb./hr. within the tolerance band of $\pm \frac{1}{2}$ percent.

<u>TOTAL COUNT</u>	<u>WEIGHT OF FLUID</u>	<u>TIME IN SEC.</u>	<u>RATE OF FLOW</u>	<u>CYCLES/GAL.</u>
	<u>lb.</u>		<u>lb./hr.</u>	<u>IMPERIAL</u>
268388	50	441	4081	53677.6
268086	50	369	487	53617
267533	50	533	337	53506
267875	50	335	537	53575
268164	50	294	612	53632
267346	50	265	679	53469
267041	50	240	750	53408
267092	50	223	807	53418
266460	50	203	886	53292
266319	50	189	952	53264
265878	50	176	1022	53175
266239	50	165	1090	53248
268196	50	352	511	53639

FISCHER + PORTER
MODEL 10C1505X2
SERIAL G301A3375A19

K-53326 CYCLES/IMPERIAL GALLON

K-44405 CYCLES/US GALLONS

CALIBRATED WITH WATER
SPECIFIC GRAVITY 0.9997
TEMPERATURE 20.5°C
T. H. HAMMILL
NATIONAL RESEARCH COUNCIL
ENGINE LAB 9 NOV 1965

K- CYCLES / GALLON x 10⁴
(IMPERIAL)

54

53

52

200

400

600

800

1000

RATE OF FLOW
lb/hr

+ 1/2%

