Calibration: Fischer and Porter: flow meter model 10C1505X2: serial 631 A3375A18

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FIG.
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Engine Laboratory

LAB. ORDER
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DOSSIER M2-17-14-9

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-4

Calibration

FISCHER and PORTER

Flow Meter

Model 10C1505X2

Serial 631 A3375A18

SUBMITTED BY
PRÉSENTÉ PAR Mr. M.S. Kuhring
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APPROVED
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DIRECTOR
DIRECTEUR

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 44506 cycles/U.S. gallon was measured over the range 330 lb./hr. to 1100 lb./hr. within the tolerance band of $\pm\frac{1}{2}$ percent.

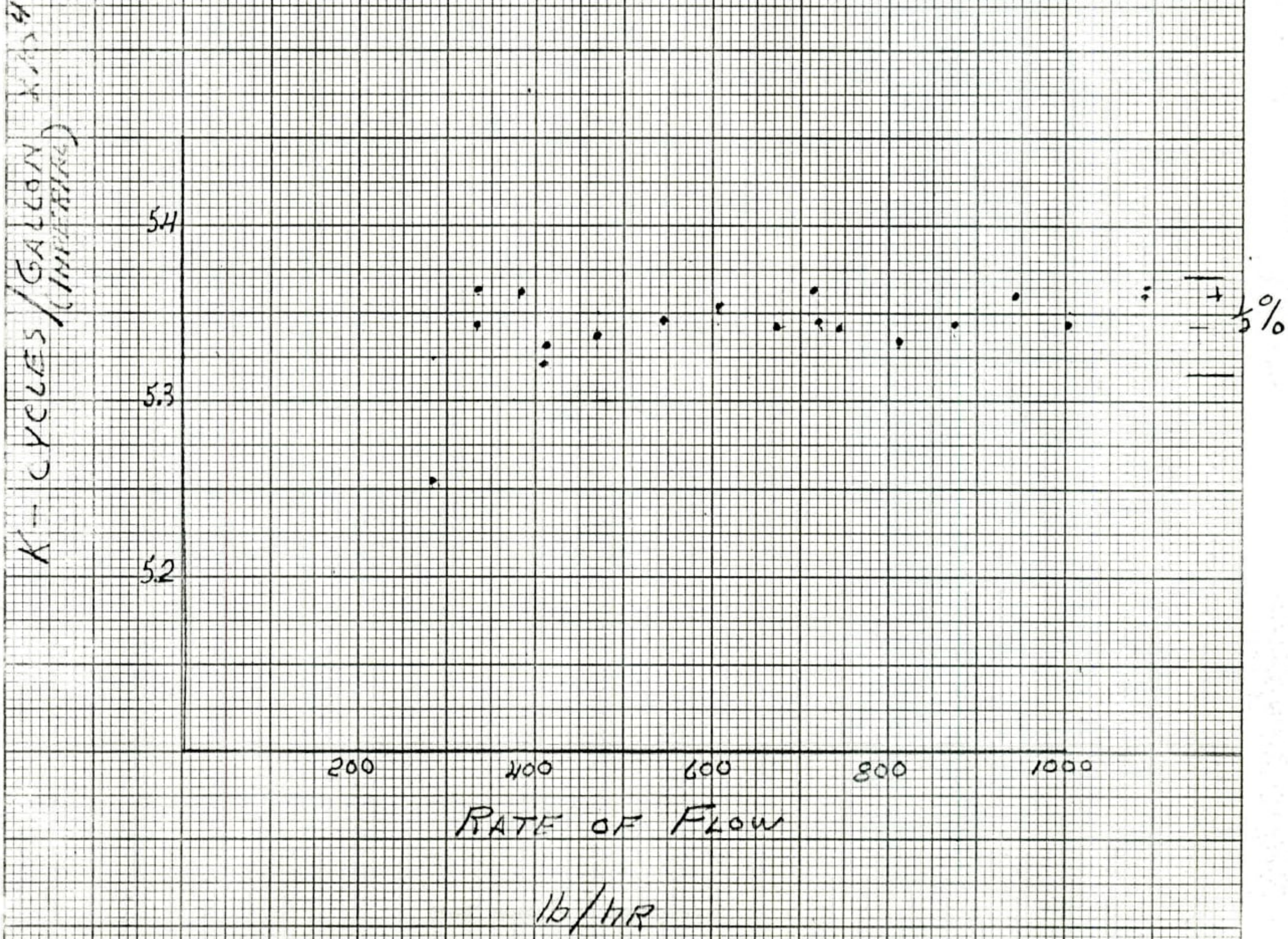
TOTAL COUNT	WEIGHT OF FLUID lb.	TIME IN SEC.	RATE OF FLOW lb./hr.	CYCLES/GAL. IMPERIAL
268321	50	482	373	53664
268193	50	535	336	53638
268013	50	165	1090	53601
268286	50	165	1090	53657
268242	50	251	717	53648
267293	50	250	720	53459
266545	50	435	413	53309
263475	50	640	281	52569
267213	50	534	337	53442
266186	50	445	404	53233
266951	50	382	471	53390
267434	50	334	538	53487
267663	50	297	606	53532
267098	50	268	671	53419
267131	50	242	743	53426
267597	50	222	810	533519
267244	50	206	873	53449
268025	50	191	942	53605
534361	100	357	1008	53436

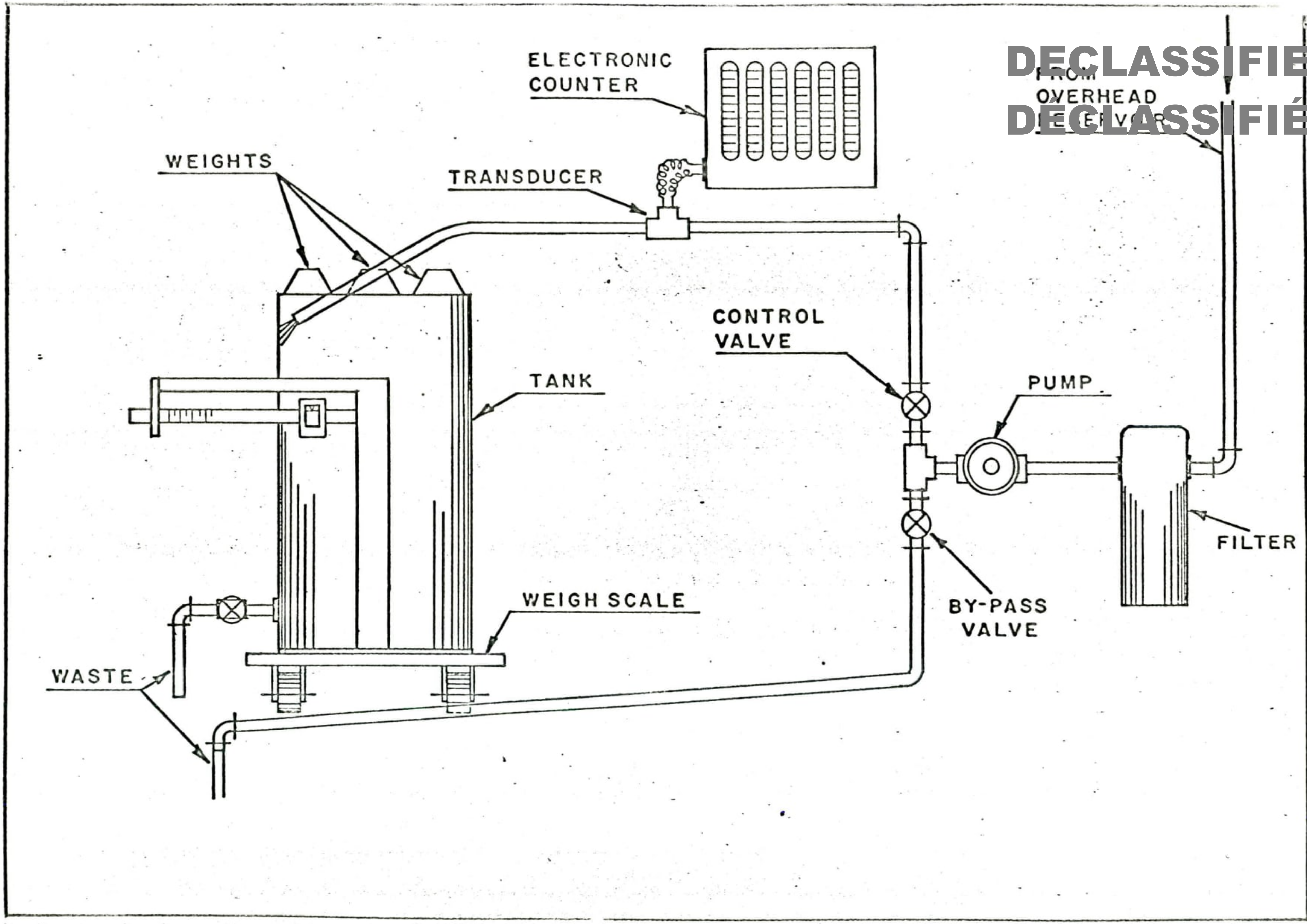
FISCHER + PORTER 1/2"
MODEL 10C1505X2
SERIAL 631-A3375 A18

K - 53448 CYCLES/IMPERIAL GALLON

K - 44506 CYCLES/U.S. GALLON

CALIBRATED WITH WATER
SPECIFIC GRAVITY 1.0001
TEMPERATURE 20.4°C
T.H.HAMMELL
NATIONAL RESEARCH COUNCIL
ENGINE LAB 5 NOV 1965

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