Calibration: Fischer and Porter: flow meter model 10C1505X1: serial 6103A2646A6

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FIG. 1
DIAG.

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DATE Dec. 8, 1965
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FOR Canadian Aviation Electronics
POUR

REFERENCE 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.
RÉFÉRENCE

LTR-ENG-3

Calibration

FISCHER and PORTER

Flow Meter

Model 10C1505X1

Serial 6103A2646A6

SUBMITTED BY Mr. M.S. Kuhring
PRÉSENTÉ PAR
SECTION HEAD
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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 2582 cycles/U.S. gallon was measured over the range 1570 lb./hr. to 10800 ob./hr. within the tolerance band of $\pm\frac{1}{2}$ percent.

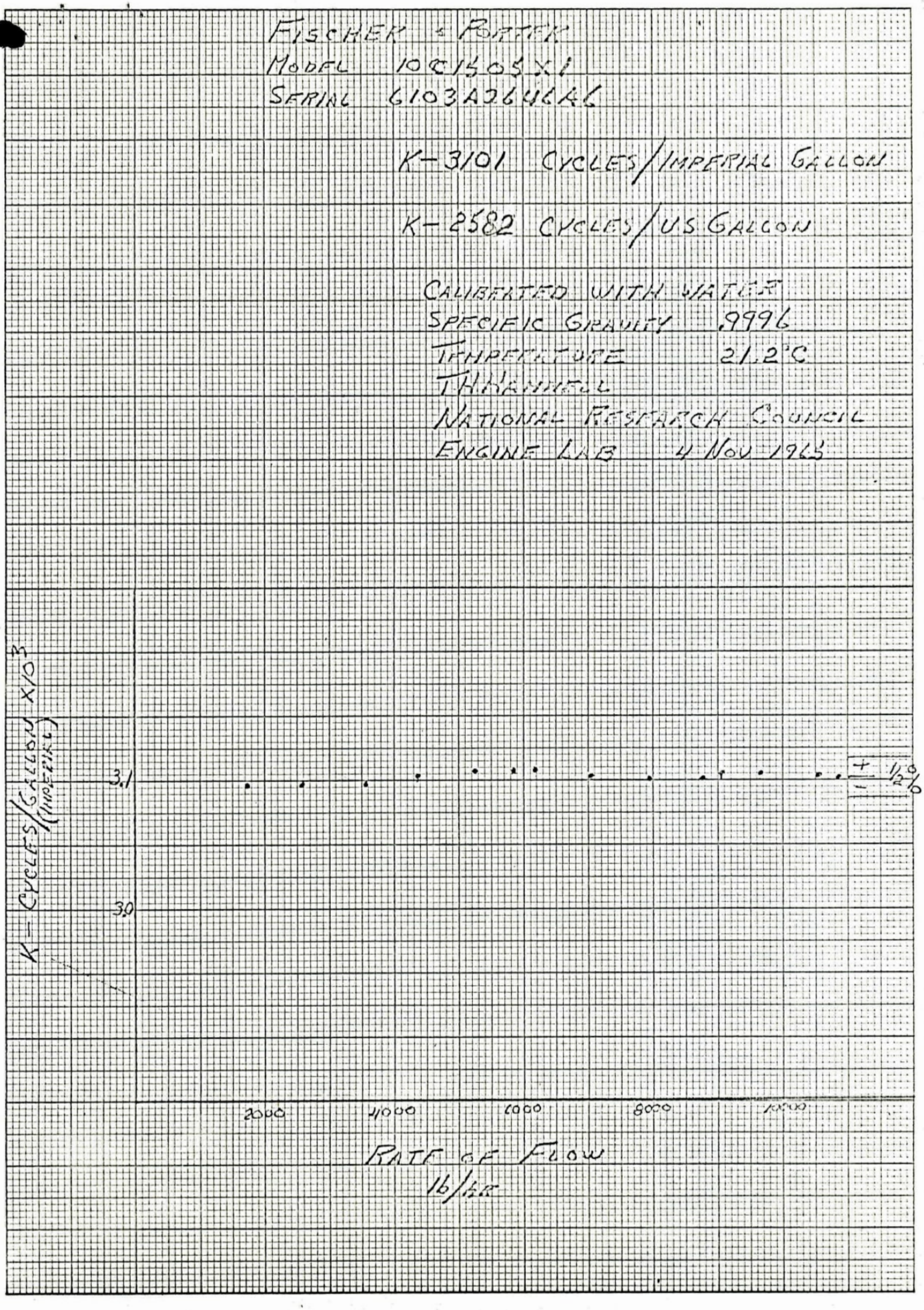
TOTAL COUNT	WEIGHT OF FLUID lb.	TIME IN SEC.	RATE OF FLOW lb./hr.	CYCLES/GAL. IMPERIAL
61947	200	280	2571	3097.3
61911	200	201	3582	3095.5
62084	200	164	4390	3104.2
62157	200	136	5294	3107.8
93239	300	175	6171	3107.9
93058	300	154	7012	3101.9
93043	300	136	7941	3101.6
124256	400	159	9056	3106.4
124075	400	164	8780	3101.7
124232	400	149	9664	3105.8
124184	400	137	10510	3104.6
124088	400	133	10827	3102.2
93260	300	183	5901	3108.6
61965	200	412	1747	3098.2

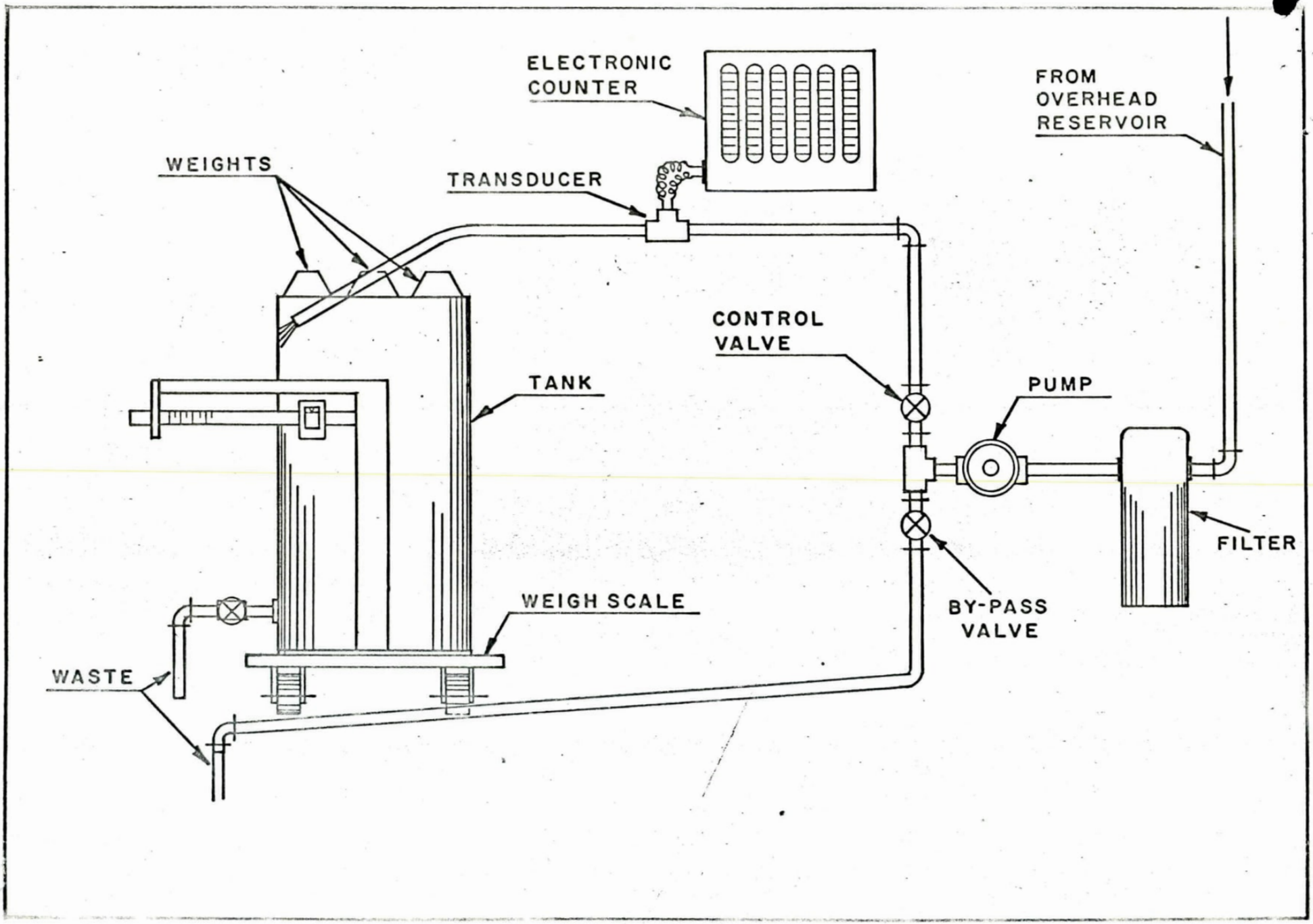
FISCHER & PORTER
MODEL 10C1505X1
SERIAL 6103A3646A6

K-3101 CYCLES/IMPERIAL GALLON

K-2582 CYCLES/US GALLON

CALIBRATED WITH WATER
SPECIFIC GRAVITY .9996
TEMPERATURE 21.2°C
THERMEL
NATIONAL RESEARCH COUNCIL
ENGINE LAB 4 NOV 1965




ELECTRONIC COUNTER
FROM OVERHEAD RESERVOIR
WEIGHTS
TRANSDUCER
CONTROL VALVE
TANK
PUMP
FILTER
BY-PASS VALVE
WEIGH SCALE
WASTE