

Appendix 1

STANDARD SERVICEABILITY TEST for PITOT-STATIC TRANSDUCER, TYPE B

LIST OF CONTENTS

	Para.						Para.
<i>Introduction</i>	1	<i>Air data test panel</i>					11
<i>Test equipment</i>	2	<i>Pitot-static transducer</i>					12
<i>Power supplies</i>	3	<i>Continuity test</i>					13
<i>Servicing methods</i>	4	<i>Leak test</i>					
<i>Preliminary examination</i>	5	<i>Pitot-static test set, Mk. 3</i>					14
Test procedure		<i>Air data test set, Type B</i>					15
<i>Preparation of test set, Type 9B</i>	6	<i>Ranging tests</i>					16
<i>Self tests on test set, Type 9B</i>		<i>Servo—follow-up test</i>					17
<i>Power supply test panel</i>	9	<i>Switching off and disconnecting equipment</i>					18

LIST OF TABLES

	Table						Table
<i>Test equipment components—abbreviations</i>	1	<i>Ranging tests</i>					3
<i>Voltage levels</i>	2						

LIST OF ILLUSTRATIONS

						Fig.
<i>Pitot-static transducer Type B, connected to test equipment</i>						1

Introduction

1. This appendix describes the serviceability tests to be applied to the pitot-static transducer, Type B, Ref. No. 6A/6435 prior to installation in an aircraft and at any time when the serviceability is suspect. The tolerances specified are not to be exceeded.

Test equipment

2. The following test equipment is required:—
- (1) Multimeter model 8 SX (Ref. No. F19-6625-99-943-1524)
 - (2) Portable pitot-static test set, Mk. 3 (Ref. No. 6C/2106) or air data test set, Type B (Ref. No. 6C/3720)
 - (3) Valve voltmeter, Type CT343 (Ref. No. F19-6625-99-943-6282) or instrument of similar range and accuracy.
 - (4) Test set, Type 9B (Ref. No. 6C/2868) consisting of the following units:—
 - Air data test panel (Ref. No. 6C/3649)
 - Power supply test panel (Ref. No. 6C/4322)
 - Distribution panel (Ref. No. 6C/3650)

Power control unit (Ref. No. 6C/2017)
Interconnecting cables (Ref. No. 6C/3651, 6C/3688 and 6C/4321).

Power supplies

3. The following power supplies are required:—
- (1) $115 \pm 2\text{V}$, 400 ± 5 c/s 3-phase, phase rotation ABC, B phase earthed.
 - (2) $27 \pm 1 - 0.5$ V d.c.
 - (3) 230V, 50 c/s (for use with the air data set, Type B).

Servicing methods

4. (1) All operations are to be carried out in the sequence listed. The operation is to be read through completely before it is carried out.
- (2) The 3-phase supply is to be maintained at $115\text{V} \pm 2\text{V}$ and $400 \text{ c/s} \pm 5 \text{ c/s}$ throughout the test unless otherwise detailed.
- (3) When tests are completed a blanking cover is always to be fitted to the pitot static and inputs of the transducer.

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(4) Unless otherwise stated, all tests of the pitot-static transducer are to be carried out with the base of the transducer level and in the horizontal plane.

(5) The unit is only to be subjected to changes of pressure when the electrical circuit is operative. Before applying pressure ensure that the pitot and static connections are correct.

(6) When power for the air data test set, Type 9B, is derived from the power control unit the auxiliary power input plug on the power supply test panel is live (*fig. 1*) and the protection cap provided must be fitted at all times.

(7) In the event of the servo indicator recording potentiometer being driven to the end of its travel, power to the servomotor is automatically cut-off by means of micro switches. To restore the power, set the A.D.S. OUTPUT switch to COUNTER RESET which will short circuit the micro switch and energize the servomotor in the correct sense to drive the potentiometer away from its end stop. The counter may now be driven to the desired reading by setting the A.D.S. OUTPUT switch to the appropriate position and operating the INCREASE/DECREASE switch. The air data test set, Type 9B, distribution panel electrical connections and cable harness associated with the transducer are identified with orange markings.

(8) Table 1 gives the abbreviations used for panels, meters, switches, potentiometers and other components contained on the test equipment.

TABLE 1

Test equipment components—abbreviations

Component	Abbreviation
Power control unit	P.C.U.
Power supply test panel	P.S.T.P.
Main ON/OFF switch	S1
SOCKET SELECT switch	S8
VOLTAGE SELECT switch	S9
TORQUE SWITCH TEST switches	S10, S11, S12
INT/EXT METERS switch	S13
M3 FUNCTION switches	S14, S15
Balance 20V (X and Y)	RV9
A.C. voltmeter	M1
D.C. voltmeter	M2
Millivoltmeter	M3
PHASE ROTATION INDICATOR	X1
Air data test panel	A.D.T.P.
SYSTEM LOAD switch	S3
A.D.S. OUTPUT switch	S4
SIMULATE switch	S5

TEMPERATURE SELECTOR switch	S6
INCREASE/DECREASE counter bias switch	S7
DISPLAY SYNCHROS potentiometers	CX1 (COARSE) CX2 (FINE)
LOG (P-S) SIMULATOR	T4
SERVO INDICATOR	G1

Preliminary examination

5. Examine the transducer for damage and clean externally using a dry rag (Ref. No. 32B/242).

TEST PROCEDURE

Preparation of test set, Type 9B

6. Connect the power supply cable to the INPUT plug on the P.C.U., as shown in Fig. 1. The pin connections are as follows:—

- A — 115V A phase
- B — 115V B phase
- C — 115V C phase
- D — 28V d.c. +ve
- E — 28V d.c. -ve.

7. (1) Set P.C.U. MAINS switch to ON.
- (2) Ensure that the neon lamp is lit and is indicating the correct phase rotation.
- (3) Check that the frequency is 400 ± 5 c/s.
- (4) Adjust the A.C. INCREASE control until the a.c. voltmeter reads 115V. Check that all three positions of the VOLTAGE SELECTOR switch is 115 ± 2 V.
- (5) Set VOLTAGE SELECTOR switch to A-B.
- (6) Adjust the D.C. INCREASE control until the d.c. voltmeter reads 28V.

8. Ensure that all four lamps of X1 (P.S.T.P.) are evenly lit.

Self tests on test set, Type 9B

Power supply test panel

9. (1) Set the P.S.T.P. switches as follows:—

- S1 to ON
- S8 to INT. P.S.U.
- S2 to 2.

(2) Set S9 to the positions indicated in Table 2. All voltages are to be within the tolerances quoted.

(3) Set S9 to OFF.

10. (1) (a) Set S14 to 20V BAL. and S15 to X100.

(b) Set S15 to successively lower ranges. The final M3 reading is not to exceed 10mV.

(c) Set S15 to OFF.

TABLE 2
Voltage levels

VOLTAGE SELECT SW. (S9)	Voltage reading		Tolerance	
	M1	M2	plus	minus
25V REF	25	—	1.5	1.5
170V	170	—	2	5
—30V	—	30	2.5	2.5
—6V (a)	—	6	0.5	0.5
+9V	—	9	0.5	1.0
—6V (b)	—	6	0.5	0.5
8V	8	—	0.5	0.5
50V	50	—	2	0
115V A \emptyset	115	—	2	2
115V B \emptyset	115	—	2	2
115V C \emptyset	115	—	2	2
20V (X)	20	—	1.5	1.0
20V (Y)	20	—	1.5	1.0
9.5V (X)	9.5	—	0.5	0.5
9.5V (Y)	9.5	—	0.5	0.5
6V a.c.	6V	—	1.0	1.0
6V a.c. PS8	6V	—	1.0	1.0

(2) (a) Set S14 to 9.5V BAL. and S15 to X100.

(b) Set S15 to successively lower ranges. The final M3 reading is not to exceed 10mV.

(c) Set S15 to OFF, S2 to 1 and S1 to OFF.

Air data test panel

11. (1) Set the switches and controls as follows:—

- CX1 and CX2 to 0 deg
- T4 to 0000
- S3 to ON
- S6 to 0.4
- S5 to OFF
- S4 to TEST 4

(2) Set S1 to ON. C1 is to indicate 00000 ± 2 .

(3) Set S5 to MACH 0 FT., T4 to 3828 and S4 to LOG P-S. G1 is to indicate within ± 20 divisions of the figure shown for LOG P-S at 150 kt, in Table 3 of the test set, Type 9B, calibration chart.

(4) Set S5, S4, S1 and the P.C.U. MAINS switch to OFF.

Pitot-static transducer

12. Connect the pitot-static transducer to PT1 and PT2 (orange plug and socket) on the distribution panel using cable assemblies CA30 and CA31, as shown in fig. 1.

Continuity test

13. Using a multimeter, carry out a continuity test on the transducer at the distribution panel patch board. Continuity must be obtained between the pins on the patch board which are joined with a white line.

Leak test

Pitot-static test set, Mk. 3

14. (1) Prepare the pitot-static test set, Mk. 3 for use as described in A.P.1275T, Vol. 1, Sect. 3, Chap. 38, and fit into the test set, Type 9B as shown in fig. 1.

(2) Blank off PITOT outlet

(3) Increase the pressure to 467-21mb and close PITOT control valve.

(4) Note the change of the test set PITOT INDICATOR reading after 3 min.

(5) Decrease the pressure to atmospheric.

(6) Connect the pitot-static transducer PITOT union to the pitot-static test set PITOT outlet, using a flexible hose not exceeding 5 ft in length (*fig. 1*). Secure the ends of the flexible hose with hose clips. Leave the STATIC union open to atmosphere.

(7) Set the switches on the test set, Type 9B as follows:—

- P.C.U. MAINS switch to ON
- S4 switch to LOG P-S
- S1 to ON

S3 switch to ON

Allow 15 min for warm up.

(8) Increase the pressure to 467.21mb and close the PITOT control valve.

(9) Note the change of the test set PITOT INDICATOR reading after 3 min. This is not to exceed 20 mb more than that observed in sub-para. (4).

(10) Decrease the applied pressure to atmospheric.

Air data test set, Type B

15. (1) Prepare the air data test set, Type B, for use as described in A.P.1275T, Vol. 1, Sect. 3, Chap. 42.

(2) Connect the pitot-static transducer to the PITOT outlet of the air data test set, Type B, distribution panel using a flexible hose not exceeding 5 ft in length and a shut-off valve (*fig. 1*).

(3) Open the shut-off valve.

(4) Set the air data test set Type 9B switches as follows:—

S4 switch to LOG P-S

P.C.U. MAINS switch to ON

S1 to ON

S3 to ON

Allow 15 min for warm-up.

(5) Increase the height to 467.21mb and close the shut-off valve.

(6) Note the change of G1 after 3 min. This is not to exceed 360 divisions.

(7) Open the shut-off valve and decrease pressure to atmospheric.

Ranging test

16. (1) Carry out the ranging tests outlined in Table 3. At each speed set S4 to LOG P-S and I.A.S. as necessary. Readings are to be

taken with increasing and decreasing speed and are to be within the tolerances quoted.

Note . . .

When switching from LOG P-S to I.A.S. G1 must be driven to the figure given in Table 3 by setting S7 to the appropriate position. On releasing the switch toggle the counters will drive to the correct reading.

(2) With S4 set to LOG P-S, check that M SW.1 opens and breaks the servo loop at a speed of between 72 and 65 kt (9.5-7mb). This is indicated by the G1 pointer oscillating over approximately 80 divisions.

Servo follow-up test

17. (1) Set S4 to I.A.S.

(2) Increase the pressure to the equivalent of 300 kt and close PITOT control valve.

(3) Set S1 to OFF.

(4) Decrease the pressure to the equivalent of 200 kt.

(5) Set S1 to ON. The synchro shall come to rest within 5 sec with G1 reading 02002 ± 35 .

(6) Decrease pressure to atmospheric.

Switching off and disconnecting equipment

18. (1) Set all the switches and simulators on the test set, Type 9B, to off, normal or zero positions.

(2) Disconnect the pitot hose from the pitot-static transducer.

(3) Disconnect the pitot-static transducer from the test set, Type 9B.

(4) Lightly smear plug and sockets threads (PT1 and PT2) with silicone compound MS4.

(5) Fit viscaps to transducer pitot and static connections.

TABLE 3
Ranging tests

Speed (knots)	Differential pressure (millibars)	Air data test set, Type B				Pitot-static test set, Mk. 3			
		I.A.S.		LOG P-S		I.A.S.		LOG P-S	
		G1 reading	Tol.	G1 reading	Tol.	G1 reading	Tol.	G1 reading	Tol.
65		M.S.W.1							
72		opens							
100	16.33	00350	±79			00350	±96		
110	19.78	00524	±62			00524	±79		
120	23.57	00698	±44			00698	±62		
150	36.99	01222	±44		±65	01222	±62		±215
200	66.43	02002	±35		±55	02002	±48		±95
250	105.13	02614	±28	See test	±50	02614	±28	See test	±80
300	153.77	03120	±24	set, Type 9B	±40	03120	±24	set, Type 9B	±75
350	213.17	03556	±21	calibra-	±40	03556	±21	calibra-	±70
400	284.37	03940	±19	tion chart	±40	03940	±19	tion chart	±65
450	368.57	04286	±19		±40	04286	±19		±65
500	467.21	04602	±19		±40	04602	±19		±60
550	581.98	04894	±19		±40	04894	±19		±60
600	714.83	05168	±19		±40	05168	±19		±60
650	867.99	05428	±19		±40	05428	±19		±60
700	1043.44	05672	±19		±40	05672	±19		±60

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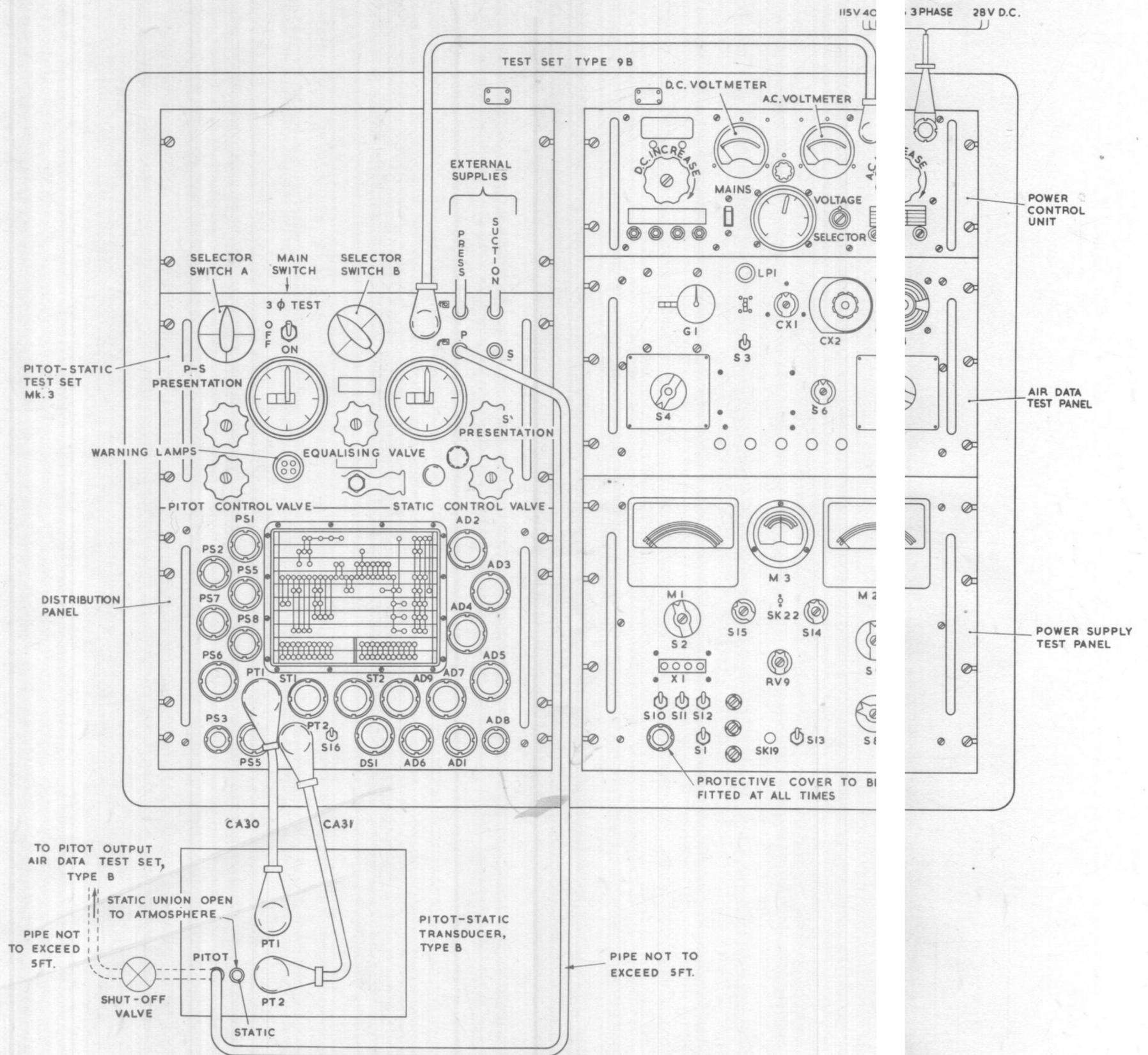


Fig.1

Pitot-static transducer, Type B, connected to test equipment.

Fig.1

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