Chapter 20

STANDBY AIR SPEED INDICATOR, Mk. 14

LIST OF CONTENTS

	Para.		Para.
Introduction	1		
Description	2	Servicing	3

LIST OF ILLUSTRATIONS

	Fig.		Fig.
Standby air speed indicator, Mk. 14 (front view)	1	Sectional view of mechanism	2

LIST OF APPENDICES

	App.
Standard serviceability test for standby air speed indicators Mk. 14	1

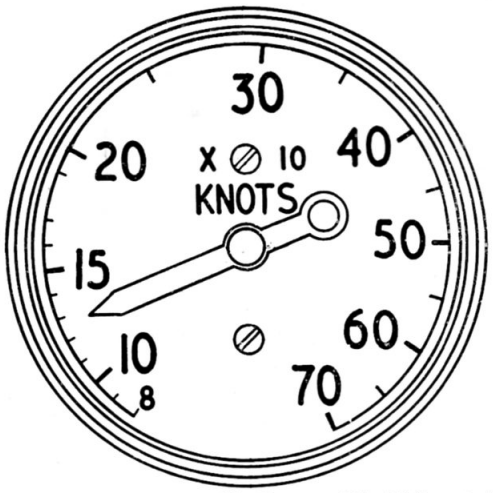

Fig. 1. Standby air speed indicator, Mk. 14 (front view)

Introduction

1. The standby air speed indicator, Mk. 14 (Ref. No. 6A/5402) is intended for use in instrument flight systems. It is a modified version of the Mk. 9 air speed indicator described in Chapter 9 of this section, the main modifications being such as to make this instrument more robust to withstand shock. The principle of construction and operation of this instrument is as described in Chapter 1. ◄ This instrument is calibrated to the full compressibility formula (*Chap.* 1, *para.* 10, *formula* (4)). ►

DESCRIPTION

2. An external view of the instrument is shown in fig. 1 from which it will be seen that the instrument scale (range 80 to 700 knots) is expanded for ◄ lower speeds and contracted for higher ► speeds. In fig. 2 is given a sectional view of the mechanism which is of the diaphragm type. Unlike the Mk. 9 instrument, this instrument has no bezel, and the sealing is effected by tightening of the nozzle nuts, thereby causing expansion of the sealing ring (6, *fig.* 2). The instrument is contained in a 2 in. flangeless case. The instrument is not anti-vibration mounted and is held in position by means of a circlip.

SERVICING

3. The instrument should be examined for damage, particular attention being given to the condition of the glass, the fixing and locking devices and to establish that there is no sign of leakage. If a fault is suspected, the instrument should be removed and tested as described in Appendix 1 to this chapter. Defective instruments should be sent to an appropriate Repair Depot.

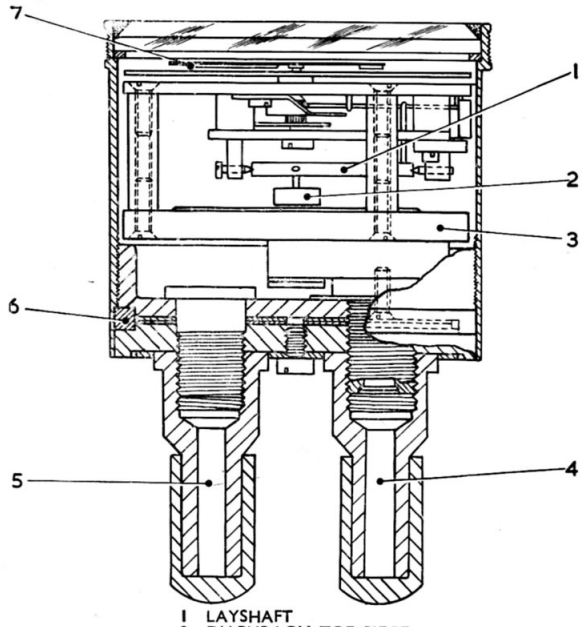

Fig. 2. Sectional view of mechanism

(*A.L.24, Sep. 58*)

Appendix 1

STANDARD SERVICEABILITY TEST FOR STANDBY AIR SPEED INDICATORS, Mk. 14

Introduction

1. The following tests must be carried out on the above-mentioned air speed indicators immediately before installation in the aircraft and whenever serviceability is suspect. They are to be applied at inspections made at Equipment Depots. The tolerances specified must not be exceeded.

METHOD OF TEST

2. During the tests given below, the instruments are to be mounted in the normal position, i.e., with the dial upright and in the vertical plane. Light tapping is permissible during the test. Sudden or violent changes in pressure must not be applied.

TEST EQUIPMENT

3. The following test equipment may be used when applying the tests:—

Item	Ref. No.	A.P.1275T, Vol. 1, Sect. 3
Micro-manometer, null reading	6C/865	Chap. 7
Differential pressure tester	6C/1155	Chap. 12
Differential pressure chamber	6C/1455	Chap. 13
Alternative equipment		
Air speed indicator calibrator Mk. 2A	6C/448	Chap. 5
Vacuum chamber, Mk. 6	6C/684	Chap. 2
Control panel	6C/706	Chap. 2
Sylphons	6C/474	—
Differential pressure chamber	6C/1445	Chap. 14

TESTS

Ranging

4. Operating instructions for the instruments mentioned can be found in A.P.1275T, Vol. 1, Sect. 3.

5. Air speed indicators, Mk. 14 are calibrated to the full compressibility formula (*Chap* 1, *para.* 10, *formula* (4)) and therefore if the micro-manometer is used for ranging tests (up to 1 atmosphere) the appropriate table (*Chap.* 1, *Table* 2) should be used.

6. If the differential pressure tester is used, direct readings are possible, as this tester is also calibrated to the full compressibility formula.

7. If the air speed indicator calibrator, Mk. 2A, is used, only the pressure scale on this instrument should be normally employed. The m.p.h. and knots scales must not be used above 300 knots as this test instrument is calibrated to the partial compressibility formula. As in the case of the micro-manometer (*para.* 5) the appropriate table in Chap. 1 must be consulted.

8. Range the instrument from zero to full scale deflection and back before checking the calibration. Check at two or three points throughout the range of the instrument, i.e., approximately a quarter, half and three-quarters full scale reading.

9. The accuracy must be within the tolerances stated in the following table, irrespective of whether the pressure is increasing or decreasing.

Mk.	Ranges over which the following tolerances must not be exceeded		
14	±5	±10	±15
	80–250	250–450	450–700

Leakage test

10. Connect the D.P. chamber to a null-reading cistern micro-manometer or low reading pressure gauge, and to a suitable source of low air pressure.

11. Place the instrument under test inside the chamber with the pitot union blanked off and the static union connected to external atmosphere via an appropriate connection of the D.P. chamber.

12. Connect a short length of rubber tubing to the outer pressure chamber static connection and insert the free end in a bowl of water.

13. Close the front cover of the chamber and gradually increase the air pressure in the chamber to 15 lb./in.^{2} above atmospheric. Maintain this pressure for one minute whilst observing the tube in the water. If bubbles appear at the mouth of the tube, the case of the instrument is leaking, and the instrument should be returned to Stores.

Note . . .

Any non-recurrent bubbling produced during initial application of the pressure, due to case deflection or thermal effects may be ignored.

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