

Chapter 8

COMPASSES, MAGNETIC, E2 TYPES

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Introduction

1. The magnetic compasses included in the Type E2 series are miniature instruments, developed for use as emergency or 'standby' compasses, where lack of space precludes the installation of the normal 'standby' compass of the P type. They also provide a rough check on the functioning of the main compass, if desired. The compass card is graduated every 10 degrees; thus it is necessary for values within this range to be estimated by interpolation. This is considered sufficient to enable the compass to be read within the accuracy expected from a compass of this type. Available types of compasses and their ancillary equipment are shown in Tables 1 and 2, and a general view showing their differences is shown in fig. 3.

TABLE 1
Compasses included in the E2 series

Stores Ref.	Item Compasses, magnetic	Type
6B/2174	Type E2	Includes correction coefficients for components B, C and R.
6B/405	Type E2A	Includes correction coefficients for components B and C only.
6B/2754	Type E2B	As the Type E2A but including direct lighting of the compass bowl.

TABLE 2
Ancillary equipment associated with Type E2 compasses

Stores Ref.	Item	Type
6A/2056	Corrector key	For use with all Type E2 compasses
6B/2755	Socket and lead assembly	Type E2B only
X 959121	Non-magnetic lamp, 28V, 040 amp.	Type E2B only
5CW/5767	Switch, dimmer type R.1900	Type E2B only

DESCRIPTION

2. The Type E2 series compasses are all similar in construction and, for the purpose of general description, may be considered identical. The variations are as follows. The type E2 has built-in correctors to correct co-efficients B and C and component R, whereas the E2A has built-in correctors to correct for co-efficients B and C only. The type E2B is a variant of the E2A, the difference being that the E2B incorporates direct lighting of the compass bowl. This is achieved by means of a miniature 28V non-magnetic internal lamp, the intensity of illumination of which is variable by means of a dimmer switch. The dimmer switch is a standard Type R with a 1900 ohms winding. This modification avoids the necessity of additional

cockpit lighting needed in the case of the E2A compass. The E2A compass will continue to be used in aircraft where the compass is satisfactorily illuminated by the normal cockpit lighting.

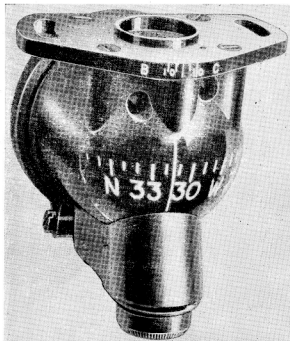


Fig. 1. Compass, Type E2 and Type E2A

Note . . .

The non-magnetic lamp has been especially developed for the E2B compass, and is identified by a separate reference No. (i.e., X 959121) and also by a red spot. As these lamps are more costly than the magnetic variety, it is necessary that they are used for compasses (E2B) only and not for any other purpose. Conversely, magnetic lamps which are dimensionally interchangeable should never be used in the E2B compass.

3. The bowl of the compass is of a plastic material and the bracket (fig. 3) which carries the stem supporting the compass system is located in a channel moulded in the base of the bowl and secured in position by two screws.

4. The compass card and dome of the system are nickel-silver pressings riveted one to the other, and the magnet, which is a complete ring of magnet steel, is riveted to the card assembly. The iridium-tipped pivot screws into the centre of the dome, the radiused pivot tip resting in a sapphire cup secured to the stem by the cup holder. The card is prevented from falling off the stem when the compass is inverted by making contact with the ceiling of the bowl. In the normal attitude the clearance between the top of the pivot and the ceiling is considerably less than that between the sapphire cup and the top of the cup holder.

5. The compass bowl is completely filled with silicone fluid chosen because it has no detrimental effect on the material (Diakon) used in the manu-

facture of the bowl, and because the temperature-viscosity changes are small. A bellows at the rear of the bowl caters for change of volume of the liquid with variation of temperature.

6. Two pairs of adjustable correctors are fitted to a metal plate which is secured to the top of the bowl. The correcting heads are positioned one on either side of the filler plug. When the corrector magnets are in the neutral position, index lines engraved on small circular rotatable plates above the magnet needles are aligned with fixed lines on the main plate. The disposition of the magnets can be understood by reference to fig. 3, the letters B and C denoting the co-efficients for which correction is being made; the positions of the appropriate heads are marked on the rim of the top plate in a similar manner. The head for correction of component R (in the type E2), is at the base of the compass, the index lines to indicate the position of the magnet needles connected with this head being to the left of the lubber line, as shown in fig. 3. Two radial slots in the compass mounting plate permit of azimuth adjustment for the correction of co-efficient A.

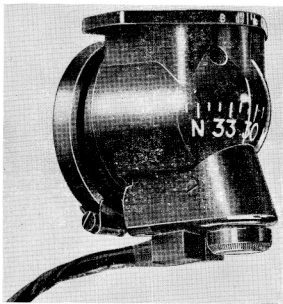


Fig. 2. Compass, Type E2B

7. A small corrector key (Stores Ref. 6A/2056), is available for use with the compass. The compass is packed in a sponge-rubber lined transit case.

INSTALLATION

8. The E2 series compasses are to be installed in accordance with the instructions given in the aircraft handbooks for the various types of aircraft. It is pointed out that if the E2 compass is installed in an aircraft the full compass swinging procedure must be followed, this to include the check for component R, even though it is known to be negligible for the particular aircraft in which the compass is to be installed. This is to ensure that the corrector itself is not introducing a deviation due to its magnets not being in the neutralized position.

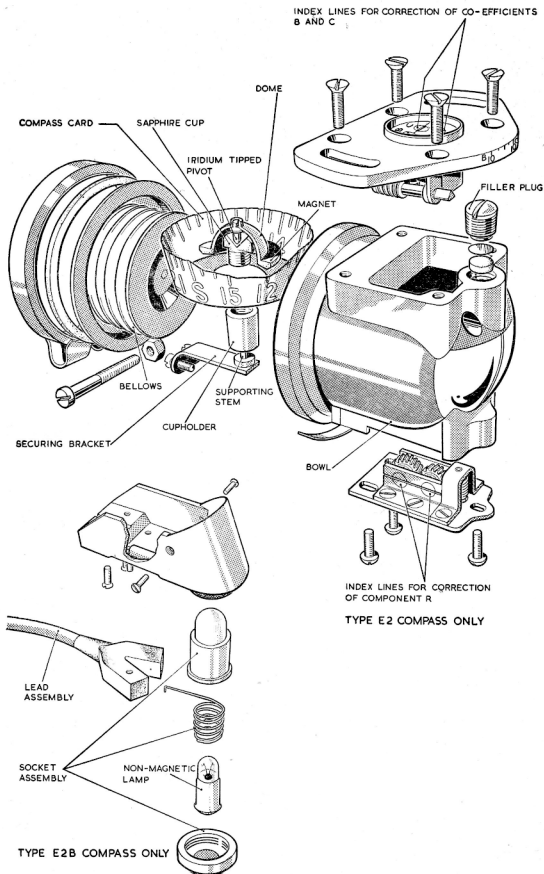


Fig. 3. Exploded view of Type E2 compasses