

DESCRIPTION & MAINTENANCE INSTRUCTIONS REFILLING PROCEDURES DIRECT READING LIQUID - FILLED AIRCRAFT COMPASSES

GENERAL

1 Direct reading liquid-filled aircraft compasses are prone to development of bubbles in the fluid which render otherwise serviceable compasses unfit for aircraft use. The refilling instructions contained in this Engineering Order are promulgated to permit Units possessing the necessary facilities to refill compasses and thus prolong their useful life between overhaul.

2 Refilling procedures are only to be carried out, when it can be determined that the affected compasses have been overhauled within the immediate past five years and other unserviceabilities are not evident. No attempt is to be made to refill compasses on which inspection indicates that leakage has been caused by a breakdown of gasket material around the bezel glass.

EQUIPMENT REQUIRED

3 The following equipment is required for the de-aeration of compasses:

- (a) Vacuum chamber or bell jar.
- (b) Vacuum pump
- (c) Barometer

NOTE

Vacuum pump must be capable of reducing the pressure in the vacuum chamber to that prevailing at 30,000 feet above sea-level for "P" type compasses or 50,000 feet above sea-level for B-16 and B-21 type compasses.

REFILLING AND DE-AERATING PROCEDURE

4 Compasses are to be refilled and de-aerated in accordance with the following general instructions.

(a) Remove filler plug from compass and top-up fluid if required.

(b) Place compass, with filling port uppermost, and a small container of compass fluid in vacuum chamber. Filler plug and gasket are to be placed in the container of fluid.

(c) Close chamber and reduce pressure slowly to that prevailing at 30,000 feet above sea-level for "P" type compasses or 50,000 feet above sea-level for B-16 and B-21 type compasses. Maintain this pressure until all signs of bubbling have ceased.

(d) Allow pressure to equalize, open chamber and remove compass. Add fluid, if required, replace gasket and filler plug as quickly as possible, ensuring that it is drawn up securely.

(e) Replace compass in chamber and again reduce the pressure to the values quoted in para. 4(c), above, and maintain this pressure for two hours. No bubbles should appear in the fluid.

5 It is desirable that all compasses be "aged" for a period of two weeks, after refilling procedures have been carried out, and then given a further altitude test prior to installation.

ADDITIONAL DATA

6 Some models of type B-21 compasses are designed with an "Air Chamber" to accommodate expansion and contraction of the fluid and thus will have an inherent bubble. The size of this bubble will vary with temperature, covering approximately three-quarters of the glass surface, at 77°F, when the compass is held face up. No bubble shall appear, however, up to an 18° angle of dive. All "Air Chamber" type compasses will be identified at overhaul with a green dot, one-quarter inch in diameter adjacent to the nameplate.

7 Ref. 34A/111, compass fluid is to be used wherever additional fluid is required.

Prepared By: **ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF**
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