



Civil Aviation Authority
SAFETY NOTICE
Number: SN-2018/002



Issued: 27 February 2018

Maintenance and Overhaul of Historic Piston Engines

This Safety Notice contains recommendations regarding operational safety.

Recipients must ensure that this Notice is copied to all members of their staff who need to take appropriate action or who may have an interest in the information (including any 'in-house' or contracted maintenance organisations and relevant outside contractors).

Applicability:	
Aerodromes:	Not primarily affected
Air Traffic:	Not primarily affected
Airspace:	Not primarily affected
Airworthiness:	All Airworthiness Organisations operating, servicing, maintaining and overhauling historic piston engines
Flight Operations:	All General Aviation Pilots
Licensed/Unlicensed Personnel:	All Maintenance Engineers operating, servicing, maintaining and overhauling historic piston engines

1 Introduction

- 1.1 A privately-owned Hawker Sea Fury aircraft operated by the Royal Navy Historic Flight was carrying out an air display at RNAS Culdrose when the engine began smoking heavily and lost power. Without sufficient engine power to continue, the pilot elected to carry out an emergency landing on the runway. When the aircraft touched down, the right-hand undercarriage leg folded, followed by the left leg. The aircraft slid to a halt, veering off the runway onto adjacent grass. The pilot exited the aircraft without difficulty and was uninjured.

The Air Accident Investigation Branch (AAIB) investigated the incident. The AAIB report concluded that the engine failure had resulted from break-up of mechanical components within the front cylinder bank crankcase. One possible failure sequence was that a lack of lubrication to the engine front bank master connecting rod caused its white metal bearing to melt.

The root cause of the lubrication failure to the master connecting rod bearing was not established, though a number of possible causes were suggested (Ref. 3.2). Consequently, the cause of the incident is unconfirmed.

- 1.2 The AAIB report contained a concluding Safety Action, stating that the investigation findings could apply to other radial and in-line engine types, and that the Civil Aviation Authority (CAA) should issue a Safety Notice (SN) for Historic aircraft operators, to draw attention to the issues and difficulties in maintaining airworthiness of ageing engines and components.

- 1.3 The information in this SN is supplementary to the published Regulatory and Guidance Material (e.g. BCAR Sections A8-23, 24 & 25 and CAP 562 "Civil Aircraft Airworthiness Inspection Procedures" Leaflet 70-80.).
- 1.4 Historic can be defined, in the context of this Safety Notice, as Engines which are no longer supported by the Type Design/Certificate holder and for which no approved Design Organisation with responsibility for continued airworthiness exists.

2 Compliance/Action to be Taken

- 2.1 This Safety Notice reminds individuals and organisations maintaining historic piston engines to ensure procedures are in place to:
- 1) ensure that absolute cleanliness is maintained when maintaining or replenishing oil systems;
 - 2) promote maintenance best practice to prevent foreign debris entering engines during maintenance/overhaul and ensure that when fitting new consumables (gaskets, seals etc.), material from the replaced items is completely removed;
 - 3) ensure the correct specifications for elastomers (rubber O-Rings, gland seals, plugs etc.) are used and that the manufacturer's recommendations with regards to storage and service lives are complied with;
 - 4) ensure that mechanical consumable parts and standard parts (or parts which have the appearance of standard parts, e.g. split pins, nuts, bolts etc.) conform to the correct specifications;
 - 5) establish a policy for the replacement or re-use of elastomers and standard parts during maintenance and overhaul;
 - 6) establish a policy for component acceptance at overhaul ensuring that, where no manufacturer's data is available, wear and corrosion are assessed and recorded in accordance with standard engineering practices;
 - 7) establish procedures to ensure that repetitive tasks for multi-cylinder piston engines are carried out without omission (e.g. checklists directly referencing cylinder numbers for rotating assemblies, crank bearings etc.).

3 Reference Information

- 3.1 AAIB Bulletin 7/2015, G-RNHF, EW/G2014/07/32
- 3.2 AAIB Bulletin 9/2017, G-RNHF, EW/C2014/07/02

4 Queries

- 4.1 Any queries or requests for further guidance as a result of this communication should be addressed to the GA Unit, Safety Airspace Regulation Group, Civil Aviation Authority, Aviation House, Gatwick Airport South, West Sussex RH6 0YR.

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5 Cancellation

- 5.1 This Safety Notice will remain in force until further notice