Civil Aviation Authority

Safety Notice

Number: SN–2025/009

Issued: 9 June 2025

Maintenance of Historic Piston and Gas Turbine Airframe Fuel/Hydraulic System Switches and Components

This Safety Notice contains information that is for guidance and/or awareness.

Recipients are asked to ensure that this Information Notice is copied to all members of their staff 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 and turbine powered aircraft and engines
Flight Operations:	All General Aviation Pilots
Licensed/Unlicensed Personnel:	All Maintenance Engineers operating, servicing, maintaining and overhauling historic piston and turbine powered aircraft and engines

1 Introduction

1.1 A Supermarine Spitfire T MKIX was operating a routine air experience flight over the South-East of England when a rough running engine and a strong smell of fuel in the cockpit caused the pilot to elect to carry out a forced landing in a field. The aircraft landed safely gear up, but sustained significant damage, necessitating the aircraft to be partially disassembled and recovered by road.

1.2 Subsequent investigations by the maintenance organisation concluded that the engine malfunction had been caused by a significant fuel leak from an airframe mounted low pressure fuel warning switch for the main engine fuel feed system. The component developed an external leak at system pressure because of casement securing screws loosening off on the switch body, possibly caused by the aging effects of internal elastomeric diaphragm components shrinking and hardening with age, resulting in the screws no longer being at the correct clamping torque. The component was approximately 70 + years old with unknown last overhaul date. The external fuel leak resulted in a cockpit low-pressure warning light illuminating, along with an engine rich cut scenario from leaking unmetered fuel ingested directly into the engine air intake, which is situated below the fuel pressure switch.

The root cause is likely to be age-related failure of the component.

These types of pressure switches (see photo examples in **Appendix 1** are found as various

part numbers and modification states on a variety of piston and gas turbine powered aircraft from the second world war period and onwards into the 1980's, airframe mounted and in some instances engine mounted, to piston and gas turbine engines. Some switches embody later modification states including wire locking of several casement body screws, along with spring washers under the heads of the casement body screws. Earlier switches may embody neither.

As a result of this incident, the Civil Aviation Authority (CAA) is issuing this Safety Notice (SN) for historic aircraft operators and maintainers to draw attention to the importance of monitoring and maintaining the airworthiness of ageing tertiary fuel and hydraulic system switches and similar components. Further information on maintenance and overhaul may also be found in CAA **SN–2021/007** and **SN–2018/002** (for piston engines specifically)

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" Leaflets).

1.4 Historic can be defined, in the context of this Safety Notice, as Engines and aircraft 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 and gas turbine engine aircraft to ensure procedures are in place to:

1) Review the aircraft systems to establish details of tertiary airframe / engine mounted fuel or hydraulic system switches and components that contain elastomeric or metallic components that may be affected by degradation due to age and or extended usage.

2) Ensure the Aircraft Maintenance Programme (AMP) includes, for these tertiary components:

- regular inspection for leakage and security of fasteners (where applicable),
- periodic operational and functional checks,
- calendar life limits where elastomers and other perishable components are present.

These tasks shall be tailored to the utilisation of the aircraft where applicable.

3) Establish a policy for component acceptance ensuring that, where no manufacturer's data is available, age, wear and corrosion are assessed and recorded in accordance with standard engineering practices. The policy should include standards for the re-use of individual elastomers and other parts subject to age degradation.

Notes:

1. Approved Technical Publications should be used wherever practicable.
2. Calendar lives should be specified where elastomers and other perishable components are present, even where parts are classified as zero hour or 'New-Old stock'.
3. The original manufacturer would never have considered that components and assemblies would be used after 70 + years of storage so a lack of a manufacturers calendar life limit does not infer an infinite life.

3 Reference Information

3.1 Known pressure switches which may be affected:

SMITHS PG221/F Ref No. 6a/ 1034 (No prevision for wire locking screws)

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SMITHS PG221/F CODE: 13PG MOD 2 (3 of the case screws are wire locked)

SMITHS PG221/F Ref No.6A/1912 CODE: 126/3PG MOD 01 (3 of the screws are wire locked)

SMITHS PG221/F Ref No. 5c/4247 CODE: 157/1PG MOD 01 (3 of the screws are wire locked)

SMITHS PG221/F Ref No. 6A/5930 99 433 3615 CODE: 156PG MOD 02 (No prevision for wire locking screws)

AIR MINISTRY PG221/F Ref No. 6A/7140 MK1 C (3 of the screws are wire locked)

AIR MINISTRY PG221/F Ref No. 1410 MK1 E (3 of the screws are wire locked)

3.2 Useful publications

- PRESSURE WARNING SWITCHES, SMITHS TYPE
  A.P.1275A, Vol. 1, Sect. 24, Sub-Sect. A (A.L.24)
- AP 112G–1141–13A

  PRESSURE WARNING SWITCHES (SMITHS TYPES)
- CAP1740: **Guidance on maintenance Programmes for Aircraft operating on a National Permit to Fly**

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.

Tel: +44 (0)1293 573988; E-mail: **GA@caa.co.uk**

5 Cancellation

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

Appendix 1

Examples of pressure warning switch devices found on historic aircraft: