



EASA Safety Information Notice

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Subject: Failure of Fuel Filler Cap, resulting in Fuel Contamination

Ref. Publications: United Kingdom Aircraft Accident Investigation Board (AAIB) bulletin EW/C2005/10/04.

Introduction: EASA received the referenced accident report, UK-AAIB bulletin EW/C2005/10/04, which describes a fatal accident with a Piper PA-38-112 'Tomahawk' aircraft, due to engine stoppage during initial climb-out which was probably caused by water contamination of the fuel. As the aircraft had been parked outside during heavy rainfall, water was allowed to leak into the fuel tank because of a deteriorated fuel cap locking mechanism which rendered the sealing function of the fuel cap unserviceable. Several "barriers", which are not specifically aircraft type related, failed before the PA-38 accident occurred. Each "barrier" by itself, if properly observed, could have given sufficient evidence that something was wrong and that corrective action was necessary.

Furthermore, water contamination of fuel due to problems with the filler caps by design, production and maintenance has been subject to several occurrence reports. For this reason, EASA decided to issue this SIN which addresses the subject of water contamination of the fuel in general.

Applicability: All aircraft, certificated in any category, fitted with upward-facing (wing- or fuselage installed) or side-facing (fuselage) fuel filler opening(s) and fuel filler neck area.

Recommendation: Maintenance:

Depending on aircraft design and relevant Type Certificate (TC) holder's instructions, inspection of the fuel filler cap and fuel filler neck area is usually described in detail in the scheduled maintenance check list/fuel system section of the aircraft maintenance manual. Independent of the details in the maintenance manual during maintenance of the fuel system, wing area (as applicable), fuselage area (wherever the fuel filler is located) it is good maintenance practise to inspect for:

- proper condition of the fuel cap seals/gaskets/O-rings (check for deterioration or cracks, proper number, position and size);

- proper condition of the fuel cap and fuel filler seal surfaces (nicks and marks within appropriate limits, surfaces are plain and smooth);
- proper condition of the fuel cap locking mechanism (bayonets, locking tabs and lugs are in sufficient good condition and not unduly worn), including O-rings sealing through bolts and key lock seals;
- proper adjustment of the fuel cap locking mechanism to make sure the fuel cap sits tight in closed/locked position and seals properly;
- drains of recessed fuel filler compartments are open, drain lines have a steady slope and allow water to drain by gravity;
- proper condition of sealing in the area around the fuel filler neck;
- attaching screws of fuel filler assemblies are tight and properly sealed.

Any discrepancies which compromise the fuel filler/cap sealing and locking functions should be rectified before the aircraft is returned to service.

Pre-Flight Inspections:

Depending on aircraft design and relevant TC holder's instructions, inspection of the fuel filler cap and fuel filler neck area during pre-flight inspections is usually described in detail in the Aircraft Flight Manual/Pilot's Operating Handbook (AFM/POH). Independent of the details in the AFM/POH, it is good pre-flight inspection practise to verify that:

- gaskets, seals and O-rings of fuel filler caps are in place and not obviously damaged;
- fuel filler neck and fuel cap are not obviously damaged;
- fuel level in the tanks corresponds to the fuel gauge reading(s) in the cockpit;
- fuel cap sits tight and secure when closed/locked; any loose or rocking fuel cap should be considered suspicious;
- drain samples are taken from the fuel tanks before first flight of the day, either after refuelling or after precipitation with the aircraft parked outside;
- drain samples are visually inspected for correct colour of fuel grade and contamination (water, sand, dirt, other fluids, etc.).

Be aware that no water droplets might be visible in the sample cup if large amounts of water are contained in the fuel tank drains. Colour and smell can also help to identify if the sample consists mainly of fuel or water.

If any doubts remain during pre-flight inspection regarding fuel cap/filler condition or fuel contamination, consult an appropriately qualified maintenance facility or maintenance engineer to have the discrepancy corrected before operating the aircraft.

Contact:

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