FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SUBJ: Aircraft Fuel System; water contamination of fuel tank systems on Cessna single engine airplanes

SAIB: CE-10-40R1
Date: July 30, 2010

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin is to inform pilots, owners, operators, and maintenance and service personnel of **Cessna Aircraft Company (and formerly Reims Aviation S.A.) Model 100, 200, or 300 series, any model and/or prefix and/or suffix in the series of airplanes as applicable** of the hazards associated with water contamination of fuel tank systems. The fuel tank system consists of all tanks, components, lines, fittings, etc., from the fuel tank to the engine.

This SAIB revises SAIB CE-10-40, dated July 27, 2010 as a result of comments received from an organization and other airworthiness authorities. It adds to the list of models potentially affected.

At this time, the FAA has determined that this airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under Title 14 of the Code of Federal Regulations (14 CFR) Part 39.

Background

Recent safety information on Cessna 150, 170, and 172 series airplanes caused us to re-examine our efforts on preventing accidents and incidents due to water contaminated fuel. Water may enter the fuel tank system via any penetration in the wing fuel tank. Water in the fuel may come out of solution, settle and make its way to a drain location in the form of a blob, pea, or BB-shaped translucent mass found at the bottom of the sampler cup. Water suspended in the fuel may lead to a cloudy or hazy appearance in the sampler cup. Water may have dissolved in the fuel, but the conditions have not yet occurred to cause the water to come out of solution and perhaps adhere to the dry tank upper surface or walls (similar to condensation). Understanding this, all pilots, owners, operators, maintenance, and service personnel of these type airplanes should assume some water exists in the fuel tank system on the airplane.

Recommendations

We recommend you do the following:

1. Check your fuel tank system to assure it is equipped with fuel drain valves (not plugs) at all permissible drain locations (i.e.; wing tanks, manifold tanks, selector valves, shut-off valves, strainers, low points, etc.). Become familiar with all drain locations on a specific model of airplane. From model to model in a series of airplanes, the number, type, and location of drains may not be the same. ***There is no single point of drainage that can be used to check for all fuel system contaminants simultaneously***. Take the time to properly check all drain locations, all of the time.

2. Check your fuel tank system to assure it is equipped with raised, umbrella-style fuel filler caps to preclude water ingress. Inclusion of reduced diameter adapters precludes misfueling also. Be sure the fuel vent system configuration of the airplane is maintained with any fuel cap selection. Incorrect fuel cap configuration may lead to reduced fuel flow, bladder collapse, oil-canning in flight, fuel hold-up in the tank, etc. with consequent engine failure.

3. With the airplane in the normal ground attitude and starting at the highest drain location, check all drain locations for contaminants before every flight, whether or not refueling has occurred. Have fuel sample disposal provisions, proper lighting, and a small ladder at your disposal to properly check for fuel tank system contamination.

- Drain at least one cup of fuel (using a clear sampler cup) from each drain location.
- Drain the fuel strainer as required to completely flush its contents in each of the fuel selector positions.
- Check for water, clarity, cloudiness, haze, proper fuel type/grade (i.e.; 100LL is light blue in tint, jet fuel is clear or yellowish), odor, or other contaminants.
- If any contamination is detected in the fuel tank system, thoroughly drain all drain locations again.
- If contamination is observed, take further samples until the fuel appears clear, and gently rock the wings and lower the tail to the ground (or raise the tail and let back down on tail draggers) to move any additional contaminants to the drain points.
- Take repeated samples from all drain locations until all contamination has been removed. If contaminants are still present, do not fly the airplane.
- Have qualified maintenance personnel drain and purge the fuel tank system. Remove all evidence of contamination prior to further flight.

4. Take proper precautions to preclude water from entering into your fuel tank system from an external source (washing, rain, snow, sleet, etc.). Regularly check all external entry sites (caps, access panels, etc.) for evidence of water ingress into the fuel tank system. When possible store the airplane indoors. If stored outdoors or exposed to wet conditions (washing, rain, snow, sleet, etc.), examine the fuel tank system drains for contamination more frequently. Pay particular attention to airplanes that have been externally cleaned and/or refinished also.

5. During annual or 100-hour inspections do the following:

- Check fuel caps, cap gaskets, cap adaptors, cap adaptor gaskets, fuel filler neck to adaptor sealer, fuel gage transmitter gaskets, gage transmitter access covers, and upper surface inspection covers for condition, proper sealing, security, alignment, etc. Ensure to service and clean these areas, replacing parts as necessary.
- Drain and flush the fuel strainer and carburetor bowl completely.
- Inspect the interior of metal fuel tanks for signs of corrosion, which may indicate water contamination.
- Inspect the interior of bladder tanks for wrinkles, broken or missing hangers, etc.
- If signs of contamination are found, alert the owner and fuel supplier of your findings for corrective action.

6. Take precautions to preclude water migration in the fuel tank system from an internal source (free water coming out of solution). Keep fuel tanks full when the airplane will not be operated regularly. Keep fuel tanks full between flights, provided weight and balance limitations permit. Limit the fuel tanks exposure to large temperature fluctuations as much as possible. If the airplane has been exposed to sustained wing low or unusual attitudes or a fuel tank has been run dry, sump contaminants may have migrated throughout the fuel tank system.

7. Know your fuel supplier. Regularly check and verify quality controls are in place to ensure you receive only dry, uncontaminated fuel from a supplier. Have on-field checks and verify to ensure continued supply of dry uncontaminated fuel to an operator. Gain assurance that the fuel supply has been checked for contamination and is properly filtered before allowing the airplane to be serviced. When ordering fuel, specifically state the exact fuel grade and quantity needed. Be present at each and every refueling and observe the fueling process.

8. Collect all sampled fuel in a safe container and dispose of properly.

9. Replace all safety items removed during contamination checks. Correct all unsatisfactory conditions found during or any examination prior to further flight.

For Further Information Contact

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Related Advisory and Service Information

Refer to Table I for a list of documents published by FAA, Cessna Aircraft Company, and the Aircraft Owners and Pilots Association (AOPA) Air Safety Foundation related to fuel tank system contamination and related issues.

TABLE I

Advisory Circular			
Document No.	**Date**	**Subject**	**Owner**
AC 00-34A	July 29, 1974	Aircraft Ground Handling and Servicing	FAA
AC 20-43C	October 10, 1976	Aircraft Fuel Control	FAA
AC 20-105B	June, 15 1998	Reciprocating Engine Power-Loss Accident Prevention and Trend Monitoring	FAA
AC 20-106	April 1978	Aircraft Inspection for the General Aviation Aircraft Owner	FAA
AC 20-122A	January 29, 1991	Anti - Misfueling Devices: Their Availability and Use	FAA
AC 20-125	December 10, 1985	Water in Aviation Fuels	FAA
AC 43.13-1B	October, 8 1998	Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair	FAA
AC 91-13C	July 24, 1979	Cold Weather Operation of Aircraft	FAA
AC 150/5230-4A	June 18, 2004	Aircraft Fuel Storage, Handling and Dispensing on Airports	FAA
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Document No.	**Date**	**Subject**	**Owner**
CE-07-06	October 27, 2006	Alcohol in auto gas	FAA
CE-06-06	October, 2005	Steel fuel tanks	FAA
CE-05-80	August 9, 2005	Cessna 120 and 140 Fuel Caps	FAA
CE-04-11	October 28, 2003	Cessna 182 Series Fuel Caps	FAA
CE-03-43R1	September 23, 2003	Cessna 100, 200, 200 and 400 series fuel quantity gauging	FAA
Cessna Aircraft Company			
Document No.	**Date**	**Subject**	**Owner**
SEB92-23	September 4, 1992	Fuel System Quick Drain Modification	Cessna
SEB92-24	September 4, 1992	Fuel System Quick Drain Valve Installation	Cessna
SEB92-25	September 4, 1992	Fuel System Quick Drain Valve Installation	Cessna
SEB92-26	September 4, 1992	Additional Fuel Tank Drain Valves Installation	Cessna
SEB 92-27	September 4, 1992	Raised Reduced Diameter Fuel Cap Installation	Cessna
SE70-28	October 23, 1970	Fuel Tank Filler Neck Sealing	Cessna
SE69-15	July 18, 1969	Fuel Tank Quick Drain Valves	Cessna
SNL98-9	October 26, 1998	Pilot Safety and Warning Supplements	Cessna
D5139-13	June 1, 1998	Pilot Safety and Warning Supplements (Reissue)	Cessna
SNL85-53	November 27, 1985	Pilot Safety and Warning Supplements	Cessna
D5139-13	October 2, 1985	Pilot Safety and Warning Supplements (Orig. Issue)	Cessna
SE82-36	July 30, 1982	Fuel Contamination	Cessna
SE80-87	October 27, 1980	Fuel Contamination	Cessna

Aircraft Owners and Pilots Association (AOPA) Air Safety Foundation			
Document No.	**Date**	**Subject**	**Owner**
Safety Advisor	Operations and Proficiency No. 5	Fuel Awareness	AOPA
Safety Brief	No. 4	Misfueling	AOPA