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**AIRWORTHINESS
CAUTION
FUEL TANK VENTILATION AND FUEL FILLER CAPS**

1. REASONS FOR VENTING

The fuel tank ventilation system has three main functions, namely, to prevent a lowering of pressure in the tank by allowing air to enter as fuel is consumed; to prevent a build-up of pressure in the tank with increased ambient temperatures; and to provide a small positive pressure over the fuel to ensure a positive flow of fuel to the engine at all times.

2. KNOWLEDGE OF THE FUEL SYSTEM

It is a matter of cardinal importance for every pilot to have a thorough understanding of the fuel system of every aircraft flown by him, and to know in detail how to operate it correctly. For example most Pilots Operating Handbooks and Flight Manuals contain very little detail concerning a proper pre-flight inspection of fuel tank vents, other than "FUEL TANK VENTS CLEAR". How to accomplish this is not always mentioned. Yet improper venting can cause fuel starvation and cause fuel cells to collapse resulting in incorrect indications of fuel contents.

3. DESIGN FEATURES

Many fuel tanks or fuel cells depend entirely on a vent hole in the fuel cap dome for proper venting. There are a multitude of design configurations and the various manufacturers have issued a considerable number of Service Bulletins on the subject of the role of such design features for proper venting. Deformed or warped fuel caps can furthermore cause the introduction of water into fuel systems. If such guidelines are not adhered to, the result will be fuel starvation. The tank filler neck gaskets or seals must in all instances be in prime condition. Some aircraft have a fuel vent tube of a defined length and protruding below the wing surface with a scarf tube end, whilst others have a NACA type of a non-icing feature incorporated in the system.

4. IN FLIGHT SIPHONING

In-flight siphoning incidents continue to occur, and investigations provide support for the contention that difficulties of this kind are attributable primarily to poor maintenance and

inadequate pre-flight inspections, these often resulting from inadequate knowledge and inadequate understanding of the respective fuel systems.

5. MAINTENANCE

During routine maintenance it is all-important to establish that the approved type of fuel caps are installed and in the proper manner. Particular attention should be given to the condition of filler cap o-rings or seals, and the cap pawls and springs, all of which play an important role in the sealing of the tank. Where caps have protection covers, their packing should be such that they seal firmly. The thermos type of tank caps should be adjusted to seal tightly and be the correct part for the aircraft concerned. All fuel vent holes, and vent lines should be free from dirt and obstructions, insects too have a habit of nesting in these areas; a matter to which the pilot should attend to prior to each flight.