
THE GAMGRAM

No. 29

PREVENTING MISFUELING

DEC. 1984

REVISED AUG. 1997

Did you know that there are 5 times more aviation accidents caused by water and dirt in the fuel than from misfueling (pumping the wrong fuel into an airplane)? We heard a supposedly responsible representative of an aircraft manufacturer say that this means the industry should concentrate on the water and dirt problem instead of the misfueling problem. What a monkey!

We already do many things to keep fuel clean and dry but what has been done in the past to prevent misfueling? The answer is almost nothing. Oh yes, we do label trucks, tanks, pipes and fill stands, but not always. The aircraft are supposed to have placards stating what fuel to use, but they do not always. Bottom loading equipment can easily be keyed with product selectors that have been on the market for 30 years but they are not always installed. In fact, only a small fraction of the apparatus is so equipped.

Misfueling accidents all have one thing in common -- human error.

After an air show, an experienced and highly professional pilot watched his light twin being refueled with a truck marked "jet fuel". Fortunately, he crash-landed safely.

A very young, untrained line serviceman put jet fuel in a cabin twin because he saw the word TURBO in the name of the airplane. Seven people were killed.

A dealer had a practice of keeping the unmarked jet fuel truck in one location and the unmarked avgas truck in another. Guess what happened. Someone made a mistake in parking the jet truck. The accident was inevitable.

A corporate pilot arrived at one of the world's largest airports and deliberately specified that he did not want fuel. He got it anyhow, jet fuel in his avgas cabin twin. The dealer caught this error before the pilot departed.

So you see, it is always human error. Fortunately, someone decides to do something positive about this crazy situation. The General Aviation Manufacturers Association promoted a campaign which is summarized below:

1. The word TURBO has been eliminated from airplane names.

GAMMON TECHNICAL PRODUCTS INC.

2300 HIGHWAY 34 MANASQUAN, N.J. 08736

PHONE: 732-223-4600

FAX: 732-223-5778

WEB: WWW.GAMMONTECH.COM

2. Decals were designed and distributed for labeling filler caps.
3. Bands were designed for labeling all overwing refueling nozzles.
4. A keying system was devised to prevent a large jet fuel nozzle filler spout from entering a smaller avgas filler opening.

The fourth action is the one that is the most important, because it overcomes human error. Research showed that 74% of avgas aircraft have filler openings that are less than 2.3" in diameter. Therefore, only 26% of the aircraft fleet needed to be modified with smaller openings if all jet fuel spouts on overwing nozzles were made larger. Through some very clever design, Shaw Aero, the largest manufacturer of caps and filler openings, developed an insert to reduce the size of large openings. These kits are offered by the airframe manufacturers, such as Piper, Cessna, Beech, Mooney and Aero Commander. All new avgas aircraft manufactured after early 1984 have a small filler opening.

The spouts on all overwing nozzles prior to 1984 were sized to fit through the smallest filler openings. However, to make the interference system work, every overwing nozzle that dispensed jet fuel had to have a new spout that is large enough so it would not enter an avgas opening. The problem was that some jet fueled aircraft have a "D" shaped opening; they are not round. The solution was a spout that is oval shaped. It measures 2.6" at the largest point so it will not enter a 2.3" opening, but it will enter the "D" shaped opening.

So now you may think that the problem of misfueling is solved. Unfortunately, it is not solved because of several other problems:

1. The FAA has not developed a clear, consistent policy. For example, owners of Cessna 300 and 400 series aircraft received AD's that mandated installation of restrictor kits but owners of Beechcraft twin engined aircraft only received Service Bulletins; compliance is not mandatory. The Piper AD only applies to Navajo and Aerostars, not to Aztecs! Very Confusing!!
2. There is no law that forces a dealer, FBO or oil company to install the new oval spouts on their jet fuel nozzles.
3. After all of the heavy research that went into the design of the system, some aircraft that use jet fuel have been found to have filler openings that are too small for the oval spout. Fortunately, some of these can be modified to the large size but others remain a problem. More about these cases will be found later in this article.