

Carbon Monoxide in Aviation

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Our home carbon monoxide (CO) detector started beeping one night last month. I had forgotten we had one, plugged into a wall outlet. I removed it and read the message on the back and called 911. Shortly three people came in a 50-foot fire truck to look at my CO detector. They tested the house and determined the unit was giving a false alarm. Some detector!

I wondered what the state of carbon monoxide detection is in general aviation. This column is the result of my research and I think you all should know about it.

Before I get to the details, here is the bottom line from Brent Blue, M.D., owner and co-founder of Aeromedix, a company that supplies aircraft accessories: "All general aviation aircraft need CO detectors, with the possible exception of pressurized aircraft (since they push air out of the cabin)." See his website *Aeromedix.com*.

The main fact to remember about CO is that it has an affinity for hemoglobin in your red blood cells 200 times as strong as plain oxygen and it takes about 6 hours for half of the CO to get out of the red cells in room air. A little CO, which is odorless and invisible, will accumulate in your blood, rendering some of the blood useless for carrying oxygen. If ten percent of your red cells were occupied by CO instead of O₂, it would be like donating 10% of your blood supply. Add the lower oxygen tension at altitude and you can have a fatal synergistic effect.

The next obvious question to ask is, why not buy a \$50.00 home CO detector for your airplane? No, the first question is, why are they not mandatory? The

answer to that question is I don't know. But I do know why you should not get a home detector. (And forget about those spot detectors.)

The reason not to use home detectors is that they are UL approved. In order to be UL approved, they will not give a reading until 35 parts per million at a minimum and alarm at 50 PPM. This is to avoid false alarms. These numbers are too high for an aircraft. A pilot needs to know early if he has a leak so he can investigate where it is coming from and correct it before it gets to 35 PPM. (Aircraft can't just pull off the side of the road.) The Aeromedix units start at 10 PPM and alarm at 35 PPM and/or a rapidly rising CO before 35 PPM.

I asked Dr. Blue to comment on the sources of CO in aircraft. He said "When we first introduced the digital CO detectors, we thought we would get a lot of heater muff reports but got very few. We think that is because they are looked at closely by A&Ps at annuals. Sites of leaks that we had reports include other parts of the firewall, wheel wells, air conditioning intakes (in a new 182), tail cones, and door seals. We had a report of CO from the vent in a Beech 18 on the ground when in certain positions relative to the wind. Most of this is related to the negative pressure in the aircraft cabin (due to Venturi effect). I even had the problem in my open cockpit biplane due to exhaust location!"

If you think that CO poisoning in aircraft is extremely rare, don't bet your life on it. Check the case reports Dr. Blue has accumulated at <http://www.aeromedix.com/aeromedix/art/co/>

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