

CALLBACK

ASRS

From NASA's Aviation Safety Reporting System

Number 228

June 1998

Carbon Monoxide Alert



Most pilots are aware that carbon monoxide (CO) is a colorless, odorless and tasteless gas contained in exhaust fumes. It is also a common by-product of chemical reactions which can occur upon heating of many petroleum products and silicone-based synthetic lubricants used as aircraft oils and hydraulic fluids.

The carbon monoxide level in blood is measured through a specific blood-gas method and is reported as a percentage. The normal level of carbon monoxide produced by the body's metabolism is from 0.4-0.7%, but heavy smokers can have much higher levels. Elevated levels of carbon monoxide in the bloodstream can create the effects of hypoxia (oxygen deficiency). Here is one air carrier crew's experience with CO:

■ *An electrical/hot plastic smell was noticed in the cabin, and the Flight Attendants reported feeling ill. Maintenance could not find any source of the odor. We started boarding passengers, but boarding was suspended when the odor returned. The Flight Attendants later went to the hospital...they had carbon monoxide levels of [up to] 1.2 [%]. Later that evening, the First Officer and I were tested for carbon monoxide and had levels of 0.5 [%] and 0.6 [%].*

Several hydraulic leaks were discovered in the engine thrust reversers and in the tail cone. The APU was contaminated with hydraulic fluid as well as the air conditioning system.

Headaches and nausea were the symptoms reported by another crew who suspected carbon monoxide exposure.

■ *After climb we noticed an unusual, faint odor in the cockpit. We tried to determine what the source of the odor might be. In the logbook, we found a previous write-up of an undetermined "ozone" smell in the aircraft. There were also two previous write-ups in reference to unexplained smoke detector activation in the lavatories.*

The First Officer said he was not feeling well. I was also slightly nauseated, had a headache, and was extremely fatigued. Both Flight Attendants also complained of the same symptoms. After arrival, we all agreed we should seek medical attention. It was 3-1/2 hours after the flight arrived that we had blood drawn. The [carbon monoxide levels] ranged from 2.3 [%] to 2.5 [%]. I am aware that these values are above normal. I wonder what the values might have been if the tests were taken just after we landed.

The source of the odors was not identified, but carbon monoxide probably caused the crew's symptoms. More information about hypoxia and carbon monoxide can be found in the Aeronautical Information Manual—Medical Facts for Pilots, Section 1, Para. 8-1-2 and 8-1-4.

Handy Detectors

A General Aviation pilot, thwarted by closed airport restaurants, initially thought that his nausea and dizziness during flight were due to skipping breakfast.

■ *I remember not being able to find my approach plates, even though they were on the floor beside me. I tried three times to set my destination into the GPS. I was confused as to what to do and panic began to set in. Fortunately, I was able to acquire the airport and complete the approach visually. Upon landing, I discovered that my carbon monoxide detector was jet black! I now suspect my disorientation was a result of carbon monoxide exposure.*

Aviation supply shops have no "missing breakfast detector" available at any price. However, small, lightweight carbon monoxide detectors are available for less than \$10, and change colors to inform aircraft occupants of the presence of this odorless gas.

The Air Up There Is Rare

Another General Aviation pilot used oxygen delivered by nasal cannula to fend off altitude-related hypoxia.

■ *During a test flight, I received a clearance to climb and maintain FL250. I was using supplemental oxygen. After about 20 minutes, I began to experience hypoxia, but I had no awareness of it at the time. This resulted in loss of altitude control by as much as 2,000 feet. Center asked me to report my current altitude, which I was unable to do due to mental confusion and inability to read my altimeter. I was given a clearance back to my home base. I wrote it down, but was unable to read it. With difficulty, and assistance from Center, I managed to descend to a lower altitude. I violated clearance limits more than once on the way down. Center was not happy. I neither felt the need for, nor requested, any assistance from Center. I now realize I was in serious trouble with acute hypoxia.*

The reporter believes that the oxygen flow rate may have been inadequate for the altitude flown. A full-size face oxygen mask might have provided more reliable delivery of correct amounts of oxygen. This reporter and other pilots of unpressurized aircraft that fly at high altitudes might consider high-altitude pressure chamber training, offered by the Air Force and the FAA. Hypoxia recognition is a beneficial by-product of this training. Information and application forms for this training may be obtained from local FAA Flight Standard District Offices. Courses are offered for small fees at appropriately equipped Air Force bases. ▲

ASRS Recently Issued Alerts On...

Canadair CA-RJ asymmetric wing flap failure
Malfunction of both fuel tank check valves on a BA-31
Continuing confusion over a rewritten New Jersey SID
Excessive rubber build-up on a Tennessee airport runway
ATR-42 loss of cabin pressure due to inflight electrical failure

A Monthly Safety Bulletin
from
The Office of the NASA
Aviation Safety Reporting
System,
P.O. Box 189,
Moffett Field, CA
94035-0189

<http://olias.arc.nasa.gov/asrs>

April 1998 Report Intake

Air Carrier Pilots	2071
General Aviation Pilots	719
Controllers	82
Cabin/Mechanics/Military/Other	97
TOTAL	2969

Wisdom from Weekend Warriors

An airline Captain traded his regular “office in the sky”—the automated cockpit of a passenger jet—for weekend flying in a high performance single-engine aircraft. Lesson learned: “Twenty years of airline operations are not necessarily good training for being a weekend warrior in a light plane!”

■ *I was flying our Bonanza—a recent purchase. We could have gone IFR, but I desired some flexibility maneuvering through an area of rain showers. Weather reports and forecasts indicated we could [go VFR]. We were on top of a scattered-to-broken layer at 4,500 feet, with seemingly good visibility. My perceptions were misleading, as in an instant we were in the soup. I was surprised and frustrated, as cheating VFR is not something I condone. I advised Center that we were unable to maintain VFR and were making a 180 degree turn.*

I am a Captain for a major airline. My background is General Aviation. I know better. The decision to go VFR should have been determined by the weather alone, and while VFR appeared do-able, it was not certain. This Bonanza is a lot harder to fly than the B-757 I drive at work. Many of the judgement/decision-making factors are totally different. I'm having to dust off operating rules that have been on the shelf for a while.

“Rattled” is the description another pilot used to describe to ASRS the results of a nighttime GA flight over a densely populated area. This high-time ex-military and air carrier pilot had fewer than 100 hours

of GA flight experience, and had joined a local flying club only two days prior to his first cross-country flight—which he elected to make at night, although severe turbulence had been forecast and reported.

■ *Experienced the worst turbulence in 36 years. Shoulder and lap belts were tight, I still got my head banged off the top of the canopy. Lasted about 5 seconds, aircraft was tossed around like a bird in a jet blast, lost 900 feet...was unable to change frequency to Tower. By the time I contacted them I was in their Class D airspace at 2,000 feet in the departure corridor for the active runway. They mentioned that to me and cleared me for a left downwind to Runway 29L. I was somewhat rattled, had asked for a right downwind entry for Runway 29R, that is what I heard, and that is where I headed. The Tower corrected my error with no small amount of frustration in the voice. I landed, the taxi was uneventful.*

Corrective actions? Our reporter thought of many—after the fact:

- *I thought I was familiar with the aircraft's navigation technology, but was not. The little 'To' and 'From' thing [flag] will forever be prominent.*
- *Contacting the Tower earlier.*
- *The aircraft has three places to set up future frequencies—use them.*
- *Get more dual time in unfamiliar environments.*

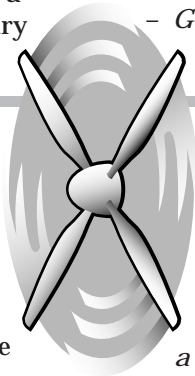
Won't Kick, Does Bite

The FAA shows hand-propping horror movies at Safety Seminars, and provides grim anecdotes of pilots who were sure they could hand-prop with impunity. One such example involved a Cessna which wiped out four (4!) tied-down aircraft before it was halted in its rampage by running into a hangar—on the opposite side of the airport!

The owner of the Aeronca Champ who reported a runaway aircraft experience to ASRS was at least somewhat aware of the airplane's propensity to take off solo, for he sought the assistance of a non-pilot. But the man was not equal to the thrust force of a Champ:

■ *Attempted to prop-start the airplane using a safety person to stand in front of the horizontal stabilizer and hold the tail. Upon starting, the airplane surged forward and turned into a C-172 parked on the ramp. The person at the tail was not qualified in the aircraft or to prop-start the airplane. Single-pilot prop starts can safely be accomplished only by having the tail securely tied down.*

A proven safe technique for hand-propping starts is to tie down the aircraft, securely chock the main gear, and have a competent person in the cockpit standing on the brakes.



Chock-A-Prop

A corporate pilot reports another incident of damage by props, this one induced by misplaced chocks.

■ *After getting permission to taxi, we had to wait for a line person who was trying to park another aircraft on our right side. The other aircraft did not park where directed, and the line person ran down to where it was trying to park. When the line person left, she put down the chocks she had in her hand, only she left them standing on end, to the right of my right engine nacelle, where they were out of my line of sight. As I turned right out of my parking spot to taxi, my right prop caught the chock and tossed it into my nose landing gear door, denting it. An A&P mechanic found the damage was only cosmetic. A contributing factor was the chocks...standing on end instead of flat, where the props would have passed over the top of them.*

Safe operating procedure for the line person should include not leaving chocks unattended and out of their usual position near a running aircraft. However, the reporter could have assured a safer taxi by waiting for an “all clear” or other definitive signal from the line person.