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Detonation Grounds a Mooney

A hiccup in the engine drives a pilot to a precautionary landing.

By Mitchell Gossman

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Mitchell Gossman is an ophthalmologist and has been flying for 30-plus years, 11 in his Mooney. *Joel Kimmel*

I've been flying for 30 years and never experienced a hiccup from an airplane engine while airborne. That changed a few minutes into a recent flight. This story can't rival a sudden engine stoppage and forced landing—it's a story of an engine that seemed on its way to quitting—but I hope it provides some useful lessons.

It was unseasonably warm on February 23 in the Upper Midwest, with a bell-clear, blue-sky day beckoning for some flying. I never have to worry about finding something to do in an airplane because I have an ongoing project of landing at every airport in North Dakota, South Dakota, Iowa and Wisconsin, the four states neighboring Minnesota, where I'd already landed at all 135 airports.

out to northern Iowa in my Mooney, starting out in the northwest part of the state and heading east toward Decorah (KDEH), landing at all airports along the way. We ended up at Decorah an hour before sunset and fueled up for the return home.

We took off uneventfully in fine weather on an instrument flight plan to Anoka County-Blaine Airport (KANE) in Minnesota, climbed to 6,000 feet, settled into cruise and leaned the engine to rich of peak. After about two minutes of conversation, I began to feel a vibration. It felt exactly like the roughness you feel when going lean of peak and beyond, to the point where the first cylinder or cylinders begin to lose power—that is, “leaning to roughness.” However, the vibration continued to get worse, and the engine seemed to be on its way to destruction, peaking in about 10 seconds, so I knew I needed to land as soon as possible. I hoped for an airport because I still had power, though Iowa farm fields would be an option if necessary.

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I started a left turn toward the nearest airport, holding altitude in order to maximize my glide range. During that turn, I considered specifically where I wanted to go. I could make a 180-degree turn back toward Decorah, where I knew they had an FBO with repair facilities. Or I could do a 90-degree turn back toward the nearest airport at the time, Cresco, Iowa (KCJJ), where we had been earlier. I decided to go to Cresco; I learned quickly that when your life is on the line, all other inconveniences are secondary.

This is where I confirmed that an iPad running a big moving map—the ForeFlight app in my case—can be a lifesaver. When making that turn, I knew generally where Cresco was because I was just there but not a specific heading. I simply turned the airplane in that direction by pointing the symbolic airplane using the moving map. I identified the town visually, and I adjusted my heading to maintain a ground track straight to where I knew the airport was. If I had used the nearest-airport feature on the GPS, it would have taken longer.

I declared a mayday call to the Rochester, Minnesota, approach controller with whom I was already in contact, and she provided information on direction and distance along the way.

Once established toward the airport, the glide-range circle shown on ForeFlight told me I was not yet within gliding range, and for that reason, I maintained altitude. All of the above took place in 20 seconds. At that point, I turned my attention to the engine, and at once, I found that the engine monitor flashed that cylinder No. 3 in my Lycoming IO-360 was running at something like 450 degrees F. I left the throttle wide open and pushed the mixture in full rich. A few seconds later, the engine started to become smoother and restored to normal after no more than 10 seconds. The cylinder-head temperature dropped rapidly. I waited until I was within gliding range, stayed high for a couple of miles beyond that, began a descent into a tight traffic pattern suitable for a possible dead-stick landing, and landed uneventfully.

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We taxied to the ramp and were quickly greeted by the local police and the airport manager who had been called by Rochester. cursory inspection of the engine revealed nothing unusual.



including the fuel injectors, spark plugs and borescope. In the meantime, we returned home via a rental car.

The inspection revealed no damage to the engine, but one spark plug on the misbehaving cylinder No. 3 had a cracked insulator. After conferring with Connell, my own airplane mechanic and some more research, the best theory was that the No. 3 fuel injector experienced a partial obstruction leading to a leaner mixture, demonstrated by the resulting higher exhaust-gas temperature—as shown in the data dump from the JP Instruments EDM 700 engine analyzer—which led to a detonation or preignition event perhaps instigated by the cracked plug (most likely detonation).

The spark plug was replaced, and the next week I hitched a ride in a friend's airplane, circled the airport to confirm all was well, and flew home uneventfully with a deliberately rich mixture. At a safe altitude over my airport, I put the engine through its paces of various mixtures, RPMs and power but could not cause any anomalies.

I've been a Monday morning quarterback and came up with the following suggestions for others:

- Don't have regrets about calling mayday. I received a benign call from the FSDO afterward, and that was it.
- Don't wait—reflexively push that mixture in full rich as you start your turn to see if that helps. It apparently did in this case.
- The engine went back to normal so promptly, I briefly considered proceeding home. Resist the temptation. Make the precautionary landing.
- Go to the nearest airport. All other considerations are secondary when it comes to threatened power loss.
- If you don't have an engine monitor, get one. I'm considering getting an audio alert for temperature alarms because I still can't believe I didn't see that flashing cylinder-head temperature. I'll be checking more frequently, at least for that flashing warning.
- Invest in a panel or yoke mount for your iPad or other moving-map display; it provides a wealth of safety information.

This story appeared in the November 2020, Buyers Guide issue of Flying Magazine

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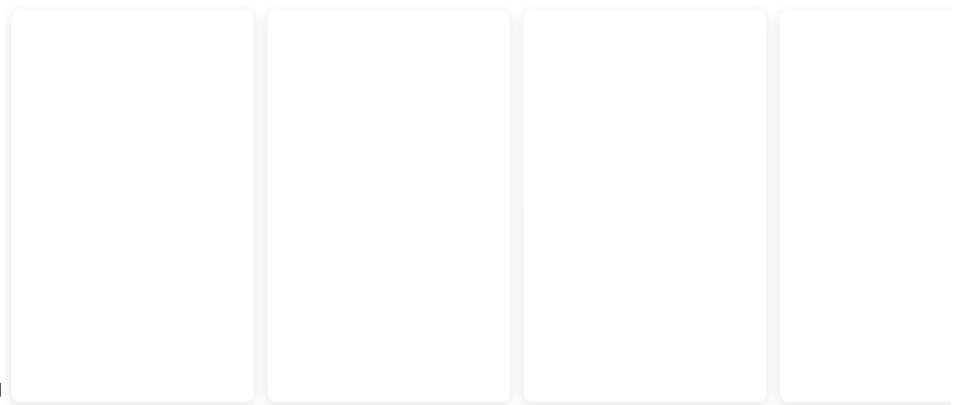
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