

Carb Heat? We Don't Need No Carb Heat!

By: Dave McClurkin

The instrument student and chief flight instructor were embarking on a stage check. Execution of the OU Risk Management Checklist was a no brainer. There were no issues identified with the IMSAFE and PAVE portions of the checklist – other than a bit of stress and external pressure to perform well on the stage check. While IMSAFE and PAVE will get you to the airplane, we can't ignore the 5P's at the bottom of the OU Risk Management Checklist (Plan, Plane, Pilot, Passengers, Programming). It's a good idea to evaluate these factors before takeoff, enroute and before landing. Any unusual occurrence also calls for looking at the 5P's.

During the engine run-up the pilot noted that the carb heat lever would not move. It was "stuck" in the off position. There was obviously something wrong with the plane. Would this situation require a change of plan? Even though there were lots of airplanes available, changing planes at this point would be a real pain. It would delay the flight at least a half hour. It was hot. Both the pilot and chief instructor wanted to get on with the flight. The pilot noted that it was close to 100 degrees out and it was unlikely there would be a need for carb heat. The chief instructor agreed. "We'll write it up when we get back on the ground," he told the pilot.

Takeoff on Runway 21 was normal. However, less than 500 feet in the air the engine suddenly lost all power. The pilot did a masterful job of executing a forced landing in the green area between I35 and the Ed Noble Parkway. Although the pilot and chief instructor walked away with only minor injuries the aircraft was later declared a total loss. Examination of the wreckage determined that the power loss was caused by broken components from the carb heat box getting sucked into the carburetor and cutting off air to the engine.

For the pilot, chief instructor and OU Aviation Department the real fun happened after the forced landing. The accident scene quickly became a sea of emergency vehicles and red flashing lights. At a speed not imagined possible two news helicopters were orbiting the scene. Vans and reporters from other media outlets arrived soon thereafter. Traffic on I35 was backed up twenty miles in both directions. Lots of people took pictures and shot videos on their cell phones as they passed by. Stories of the crash were featured on five TV stations that evening and articles in the Norman Transcript and Daily Oklahoman the following day. The distinctive interlocking "OU" logo and "1" on the tail fin of the aircraft were prominently shown in all the pictures and videos. Public reaction was not good. Some people were heard to comment, "Gee, I didn't know OU had an aviation program!" Officials at the university and aviation department fielded numerous phone calls expressing concern over the safety of the aviation program and flight training in general. Two members of the Norman City Council subsequently introduced an ordinance to ban all flight training activities at Max Westheimer Airport. Aviation Safety Inspectors from the FSDO made numerous visits to help the new chief instructor ensure that aircraft checklists were done properly.

OK, other than in the over-active imagination of the chief instructor none of the events in the previous two paragraphs actually occurred. Upon detecting the stuck carb heat lever the pilot and chief instructor discussed the situation. Yes, there are provisions for flying with inoperative deice and/or anti-ice equipment. Certainly there was no threat for carb icing. Yes, changing aircraft would be a pain. Depending on the student's and chief instructor's schedule it might even mean cancelling the flight. But, carb heat does not function independently. It is attached to a critical component of the airplane – the carburetor. The pilot and chief instructor came to the same conclusion. This hazard has created a risk. The probability of engine failure might be low, but the severity of an engine failure would be extreme. We will mitigate (in this case eliminate) this risk by giving this airplane to maintenance and checking out another airplane.

So, what was the deal with the stuck carb heat lever? Well, the chances of components of the carb heat mechanism blocking the carburetor and causing an engine failure were extremely low. However, maintenance personnel did advise that although the carb heat lever was stuck in the off position, **the carb heat itself was in the full on position**. Had we elected to take the plane, for at least an hour we would have been dumping super-heated air into a hot engine on a hot day. That most likely would not have caused any long term damage. In the short term however, the engine would have been developing less power than anticipated. On a hot day our warriors are doing good to get 200 feet per minute in the climb out. What would that climb rate have been with a couple hundred less RPM?

A few final thoughts:

When we run our checklists we don't detect an abnormality on most occasions. This means that when we do detect an abnormality we need to get past the denial stage, make some decisions and take the appropriate action. The 5P portion of the OU Risk Management checklist is there to help us do just that.

I don't want to create a state of paranoia, but sometimes it is a good idea to imagine the consequences of ignoring a hazard and not mitigating a risk, particularly when the probability of occurrence is deemed to be low!