

GA1332

Posted on 06.12.2022 by Steve Forward

Category: [General Aviation](#)

Report Title Take-off with one magneto

Initial Report

As part of the power checks before take-off, I checked the RPM drop on both mags. The mag selector is a rotary key type switch. Whilst performing this check I accidentally rotated the key to both mags off. As I heard the engine dying I quickly turned the key to switch the mags on before the engine stopped. My main concern was that the engine requires starting by hand-turning the propellor, and I didn't want to go through this procedure, particularly near the threshold of the runway.

On completion of the checks I lined up and began the take-off run. Immediately I noticed a roughness in the engine, which was about 200 RPM below what I expected. The runway was long and the aircraft eventually became airborne with a reduced rate of climb. I decided to continue into the circuit and return to the airfield. On the downwind leg I noticed that the mag switch was at magneto 2 only. I turned it to both and full power was restored. I continued the flight uneventfully.

I had recently converted to this aircraft. My previous type had separate magneto switches which provides a clearer visual picture of the magneto states than a rotary key switch. Furthermore there are no markings to indicate "off", "mag 1", "mag 2", "both" on this aircraft.

Lessons learned: Do not ignore poor engine performance during take-off. The runway was long enough to have done a safe abort and investigate the problem before becoming airborne. If a problem or distraction occurs during checks, repeat them from the beginning.

Comment

This is the second report we've had this year about pilots getting airborne with only one magneto selected and we repeat our comments below from the previous edition of FEEDBACK. As the reporter identifies themselves, aside from the issue of potential distraction during checks or 'press-on-itis' to get airborne, the main concern is not to ignore reduced engine performance during the take-off because it might be something much more serious and indicative of an impending engine failure. For those who regularly fly the same aircraft, keeping a log of rpm achieved when selecting full power on take-off is good practice because it can give early indication of any developing problems. As an aside, be cautious about selecting magnetos back on with the engine rotating if 'off'

is inadvertently selected because it can result in engine damage due to backfiring.

CHIRP Comment from Report GA1313 in GA FEEDBACK Edition 93: Although there are of course engine-specific tolerances for achieving maximum rpm during take-off, experiencing much-reduced rpm after applying full power is a serious issue that should immediately ring alarm bells. The reduction in power could be for any number of reasons ranging from magneto failure, FOD partially obstructing airflow, or even imminent engine failure so, if there is sufficient runway available, pilots should consider immediately aborting the take-off in such circumstances and stay on the ground. Although there was plenty of runway available in this instance, a good rule of thumb for assessing performance is to calculate the expected take-off run required for the pertaining conditions and then identify a stop point 1/3 along this distance such that if the aircraft has not achieved 2/3 of the required airspeed by this point, the take-off should be aborted. If a problem like this is encountered shortly after take-off then don't forget the option may also be available to land ahead on long enough runways. And don't be shy of speaking to ATC if you are trying to resolve an issue once airborne. Not only will it help them to make preparations in case you do need to return to the airfield, but they can also help you by advising of any other aircraft or obstacles in the area that might be a potential threat whilst you are heads-in trying to sort out the problem.

It's easy to be wise after the event about the thoroughness of checks etc but we are all human and sometimes make mistakes. The key thing is to establish why the check was missed in the first place. We don't know for sure, but could there have been distractions at that moment in time which might have caused the pilot to miss a part of the checklist and not ensure that the magneto selector was at both? If you are aware or suspect that you've been distracted, disturbed or rushed during checks, best practice is to return to the start of the appropriate section of the checklist and start again. Also, when carrying passengers, brief them about the need for a 'sterile cockpit' at important times such as pre-take-off, take-off and landing so that there are no extraneous conversations that might cause such distractions.

Finally, this report demonstrates well that both magnetos are required for maximum engine performance, the second one is not there just in case the first one fails! One of the immediate actions on experiencing low power during the take-off or climb should be to check that both magnetos are selected on.

Key Issues

Dirty Dozen Human Factors

The following 'Dirty Dozen' Human Factors elements were a key part of the CHIRP discussions about this report and are intended to provide food for thought when considering aspects that might be pertinent in similar circumstances.

Pressure – press-on-itis to get airborne after a mistake in power checks.

Distraction – not fully completing the magneto test by not selecting them to both.

Complacency – continuing the take-off with reduced power available.

pressurePressure

distractionDistraction

complacencyComplacency



