GA1362

Posted on 15.05.2024 by Steve Forward

Category: General Aviation

Report Title Engine stop on landing

Initial Report

Flight from [Airfield] in very high carb icing risk: [nearby airfield] METAR soon before flight probably had temp 5ºC, dew point 4ºC. Carb heat was on at normal cruise revs of 2400 from early downwind for [RWY]. I was at about 600ft AGL due to low cloud. After my downwind call, I heard a gyrocopter on base leg. I had already done a go-around the lap before due to the aircraft ahead blocking the runway by taxying along very slowly after landing. I therefore decided to slow down as I would be much faster than the gyrocopter and could be blocked again.

To slow down, I selected about 2200 RPM (still with carb heat on) late downwind and probably put 10º flap down to try to slow down to about 75/80kts. Base and final were completely normal engine running – the whole flight had been though I had noted possible icing on one FREDA check. I had used the carb heat quite a lot on the flight. I closed the carb heat at 200' on finals, as I have always done since being taught that. I should think I closed the throttle at about 50' after having been intentionally "high" to clear tall trees on finals on [RWY]. Landing was completely normal and a good one until I noticed the prop had stopped rotating while I was still going on the landing roll at perhaps 30kts. I was going too fast to exit the runway at the first available exit and slightly too slowly to exit at the next one. I got about half way off the runway before stopping and reported into the A/G.

I was then confused because the engine would not crank (I had not turned the starter master on – this is turned off just after engine start. After pulling the aircraft off the runway and having a think, the aircraft was easily started 20mins or so later and taxied back to its parking place with the engine running totally normally.

It had obviously been a carb icing incident, the carb icing risk being extremely high. Reducing engine revs to slow down due to the slow gyrocopter ahead was, I should think, a contributory factor. I had no spluttering or lack of power at all on this flight, the first indication of an issue being the stationary prop. I would imagine the ignition failed when I selected idle on very short finals. Though this is contrary to CAA carb icing advice (which suggests carb heat cold at 300') I have since been questioning the wisdom on this occasion of selecting carb heat cold at 200' when I had smooth landing weather with wind shear very unlikely and a very long empty runway ahead.

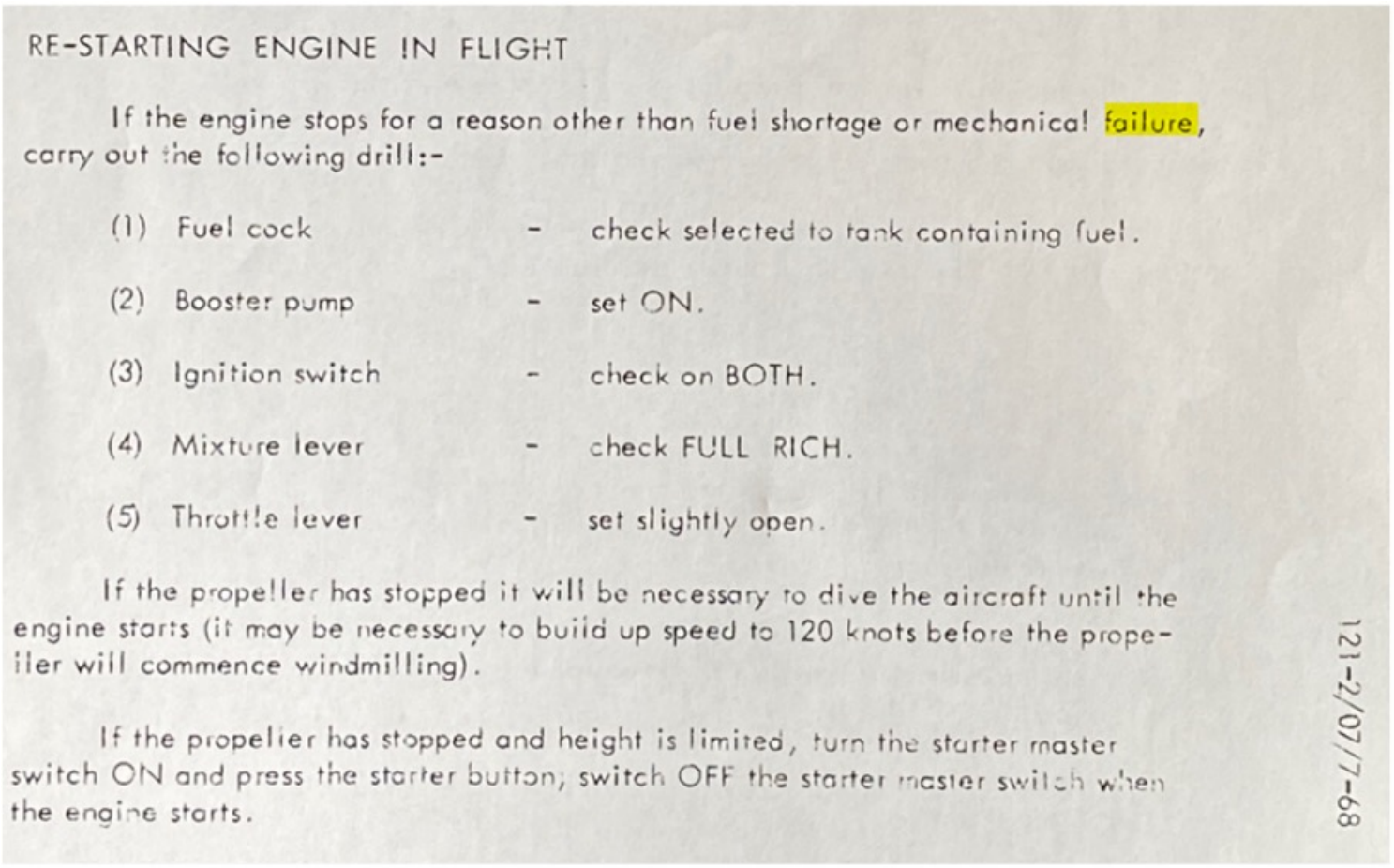
Lesson learned: in severe icing conditions, use a lot of engine power downwind with the Carb heat on/do not reduce power to slow down until into base leg. Use flap for drag and extend the circuit at high power when likely to be blocked by slow aircraft.

This was the first time I have really been “defeated” in a decision-making process and I think this was in decision-making terms a mixture of:

1. Low cloud with temp and dew point giving a very high chance indeed of carb icing, especially at reduced revs.
2. Desire to land as I had already had to do one go around due to another aircraft, a taildragger that was taxying carefully and rather slower than expected exiting the runway (I had loads of fuel though).
3. Very slow gyrocopter ahead in circuit tending to make me try to make from downwind through base and finals longer in time. I didn’t want to get permanently stuck behind the gyrocopter doing circuits: they do a much shorter inner circuit at much lower speed over the ground on finals that could nevertheless take a similar amount of time as me.
4. An intimidating forest on [RWY] finals at [Airfield], always a factor for me against an extended downwind/ long final approach, tending to make a longer final never preferred.
5. I was trying to delay with lower speed rather than longer length (extending downwind).

Thinking more, I doubt that selecting carb heat cold at 200’ played much of a part as the revs had been quite low, well below 2000 on base and final for a while so not a lot of heating had been happening anyway. There was possibly only a bit of ice but enough to block the flow when I closed the throttle for/in the flare.

Finally, regarding turning the starter master switch on (blindingly obvious in hindsight) to crank, I confirm this is as attached in the aircraft’s owners’ manual emergency section as attached (last para) though it is strangely not in my checklist I have used for >20 years. It is something I should have memorised but hadn’t. This issue was all after I had stopped on the ground and I have to say made me very confused indeed as to how two unrelated issues had apparently happened together until I had a little think.



RE-STARTING ENGINE IN FLIGHT

If the engine stops for a reason other than fuel shortage or mechanical failure, carry out the following drill:-

(1) Fuel cock	-	check selected to tank containing fuel.
(2) Booster pump	-	set ON.
(3) Ignition switch	-	check on BOTH.
(4) Mixture lever	-	check FULL RICH.
(5) Throttle lever	-	set slightly open.

If the propeller has stopped it will be necessary to dive the aircraft until the engine starts (it may be necessary to build up speed to 120 knots before the propeller will commence windmilling).

If the propelier has stopped and height is limited, turn the starter master switch ON and press the starter button; switch OFF the starter master switch when the engine starts.

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Comment

It's not possible for *CHIRP* to diagnose what actually occurred but such incidents do highlight the value of checking whether the aircraft carb heat intake/heat exchanger valve flap is fully functional during maintenance and the pre-flight walk-round if possible. It's also important to ensure that the recommended engine power checks are conducted before take-off to confirm the expected power decrease when carb heat is selected (typically 75-100rpm or 3-5" manifold pressure) thereby confirming carb heat functionality. Selecting carb heat to cold is standard procedure on short-final in many aircraft so that maximum performance is available in case of go-around, and a height to do this will normally be stated in modern flight manuals (usually around 300ft). For those seeking more information and background on carburettor icing, CAA Safety Sense Leaflet 14 'Piston Engine Icing' is a really good read. As an aside, and not mentioned in SSL14, taxying over wet grass can cause moisture to be picked up in some intake/carburettor configurations and this can also result in carb icing.

Key Issues

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** – trying to fit in to the circuit with slower aircraft present.
- **Awareness** – low power setting in the circuit reducing carb heat output.
- **Complacency** – assumption that the carburettor was sufficiently heated.

pressurePressure

loss_of_awareness Awareness

complacencyComplacency