

ENGINE ON, ENGINE OFF

A bank-run pilot learns first-hand the perils of improvised procedures.
By Mark Bennett.



Photo: Rob Fox

Back in the 1990s I flew bank runs from Bankstown aerodrome for a Sydney-based operator. The company had about a dozen light twins, most of them B55-series Barons.

I'd been flying commercially since 1988 and, with about 2000 multi hours, I considered myself to be safe and efficient. It was a good job and most of us were happy to be building our hours on the way to a prized airline interview.

Our employer was reasonable, and any cowboy behavior was frowned upon. We always planned IFR regardless of the weather, and were even paid the award. Having said that, it's almost inevitable that single-pilot freight drivers, left to their own devices, will devise their own ways to get the job done as "efficiently" as possible. In our operation there was no formal check and training, save the mandatory annual instrument rating renewal.

In my case, one of these improvisations nearly got me killed.

B55-series Barons have four fuel tanks, – two main and two auxiliary tanks. This differentiates them from the B58 series, which has just two main tanks. The two extra tanks didn't pose any obvious problems, especially as this arrangement is common to a great many light twin aircraft.

Standard fuel management procedure in the Baron was to takeoff, climb, descend and land with the main tanks selected. The idea was that the outboard or auxiliary tanks should only be selected in cruise.

It should be noted that although the aircraft has four tanks, there are only two fuel gauges on the panel. A toggle switch allows you to select the fuel gauge to the tank currently in use. Needless to say, if you forget to select the switch to the tank you are using, you will not know how much fuel you have left.

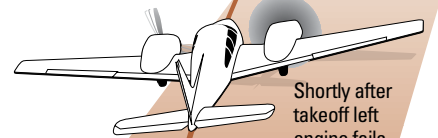
One of our runs took us via several ports from Bankstown to Coonabarabran and back again in the afternoon. I soon realised that if I only selected the auxiliary tanks in cruise – as recommended – there would be an excess of fuel in those tanks when I got back to Bankstown in the evening.

A more desirable situation would be to use virtually all of fuel from the auxiliaries earlier, and therefore have a known quantity in the mains for the last couple of sectors home. Of course, the only way to do that was to select the auxiliary tanks during climb and descent. I would switch back to the mains as part of my pre-landing checks and almost without fail, there would be just a few gallons left in the auxiliaries when I joined the circuit at Mudgee on the way home in the afternoon.

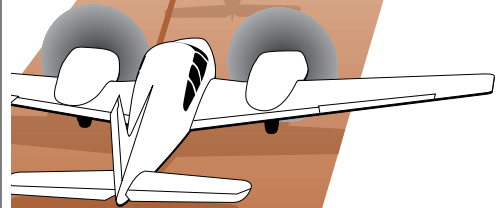
Alternating engine failure and surge continue as fuel supply from the auxiliary tanks fluctuates.



Right engine fails. Left engine regains power.



Shortly after takeoff left engine fails, aircraft yaws. Rudder applied.



Cockpit placard fitted between the fuel selector handles (Source: Beech Baron B55 manual)

Adverse effects: Fuel flow problems led the Baron's engines to take turns at failing.

Juanita Franzl

Th is left me with the main tanks approxi- mately $\frac{3}{4}$ full for the final two sectors home.

On the day of my incident, I approached the circuit at Mudgee as I had done count- less times before. Th e wind was light and variable, so I joined a standard downwind for runway 04. As I selected the gear down I was momentarily distracted by a radio call from another aircraft. Th at sorted, I pro- ceeded to land.

Turnarounds were fairly tight in those days: pull up on the apron, shut down the right engine, agents come running over, bags go in the back, thumbs up, crank up the engine, and we're gone.

As the winds were light, I decided to make a short backtrack and takeoff in the opposite direction on runway 22. Turning at the end, a cursory glance at the gauges showed the tanks were about $\frac{3}{4}$ full. Th e gauges were in the green so I applied full power. Th e D55s have the big engines, so acceleration is won- derfully brisk. Before long we were at takeoff safety speed, in this case approximately 90 kt.

Stall warning: No sooner had the wheels left the ground than the left engine failed! Th ere was quite a yaw and I corrected with rudder. Almost immediately, the right engine failed. Th e left engine then roared back to life with all the consequent adverse aerodynamic effects. Th e left engine then failed again, and then the right engine roared back to life!

What we now had was two 520-cubic inch Continentals at full throttle taking turns at surging as large gulps of fuel and then air were sucked in.

While all this was going on the runway had passed behind me and I was at 100 ft with the airspeed well below blue line and approaching Vmca. Th e stall warning was starting to chirp, and I was moments away from losing control. Th e area ahead was not suitable for a forced landing, though I have to admit I didn't even consider it. All this had taken mere seconds, but even now I can see it clearly in slow motion as if it occurred yesterday.

Th ere's nothing like a life threatening moment to focus the mind. Th e previ- ous distraction in the circuit had led to a breakdown in my pre-landing checks and I had inadvertently left the auxiliary tanks selected. As luck would have it, I had seen this before – albeit at a safe altitude – and the large fluctuations in fuel flow had caught my attention.



Fuel management: The B55 – series Baron has four fuel tanks – two mains and two auxiliaries

Cursing myself as the events unfolded, I reached down to change the tanks. Once I had a spare hand I turned on the auxiliary boost pumps. Th ankfully, with seconds to spare, the engines responded quickly and evenly and the old Baron climbed sweetly away.

Flying experience is certainly a many fac- eted thing. It can lead to complacency and the adoption of potentially dangerous prac- tices. It can also equip us with the resources to deal with some very diffi cult and confus- ing situations. Because I had previously ex- perience the onset of fuel exhaustion, I was

able to react very quickly to a dangerous situ- ation of my own making.

Th ere's an old saying that you live and learn. I know of several accidents that have been attributed to fuel starvation by incorrect tank selection. Tragically, some were fatal. Th e procedures are laid down in operations manuals and pilot operating handbooks and are quite often the result of bitter experience. If we choose to ignore the mistakes of others, and casually deviate from the rules, we do so at our peril.

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ANALYSIS: ON THE LINE

As the author rightly points out, a signifi- cant contributing factor in this incident was his failure to follow the recom- mended procedures set out in the pilot's operating handbook and the operations manual.

But that's just one factor. Most inci- dents are caused by a series of safety breakdowns, and this one was no excep- tion.

What systems did the company have in place to ensure that its pilots were aware of and adhered to standard operating procedures? Implementation of a simple "route check" system – where the chief pilot periodically accompanied line pilots on operational flights – may have identi- fied the non-standard fuel management procedure and corrected it.

A route check system may have also identified weaknesses in the pilots' con- duct of aircraft checklist procedures. It's probably fair to say that the checks in this instance were conducted haphaz- ardly. It's quite common in this type of operation for checklists to be conducted

from memory. Of course, memory-based checklists are more fallible than written checklists, particularly when workload is high, or if the checklist is interrupted by something "more pressing".

In this story, the pre-landing check was disrupted by a radio call and con- sequently the fuel selection check was overlooked.

After a short turnaround the fuel selec- tion was again overlooked. Did the pilot use an improvised pre-takeoff check? If the chief pilot conducted regular checks of the line, it's probable these potentially hazardous procedures would have been identified and eradicated.

Fortunately, when the engines failed due to fuel starvation, the pilot had the experience and skill to avert an accident. Th e final link in the chain of events was broken.

I'm sure the pilot chief pilot, and man- agement of the company would agree that it would have been better if the chain had been broken earlier. It certainly would have saved the pilot some unnec- essary stress.

– Maurie Lewis, CASA flying operations inspector.